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## 6. Gayophytum A. Juss.

Erect short-lived annuals with very slender, usually tortuous stems, and alternate, linear leaves. Flowers very small. Sepals 4, the calyx tube not prolonged above the ovary. Petals 4, rose-colored or white. Stamens 8, those opposite the petals smaller, with sterile anthers. Styles clavate or capitate at the apex. Capsule linear or linear-clavate, often

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constricted between the seeds, 2-chambered, opening with 4 valves. Seeds ~~often~~ without a coma.

o Pods strongly flattened laterally, not constricted
4 between the seeds; leaves 2-3 mm. wide — 1. G. humile

o Pods not flattened laterally, constricted between
4 the seeds; leaves 1-2 mm. wide

2 Petals 2 mm. long — 2. G. lasiospermum

2 Petals 1-1.5 mm. long

4 Stems glabrous — 3. G. ramosissimum

4 Stems clothed with spreading hairs — 4. G. Helleri

1. G. humile Juss. A low glabrous annual 10-15 cm. tall, branching mostly at the base, the stems shining, reddish; leaves linear-oblanceolate, 1.5-2.5 cm. long, 2-3 mm. wide, sessile, somewhat fleshy for the genus; flowers axillary but opposite the leaves on pedicels 1 mm. long or less; sepals 1.5 mm. long, ovate, soon reflexed; petals 1.5 mm. long, white, spreading; mature ~~pod~~ capsule 12 mm. long, 2-2.5 mm. wide, oblong, strongly flattened laterally, not constricted between the seeds; seeds .8 mm. long, oblong, smooth. (G. pumilum S. Wats.)

Seen only in compact muddy ground along trail through a subalpine meadow, Fish Lake, 6000 ft., Epling and Houck 9705. Cedar Mts. and Lake Waha (fide Munz).

2. G. lasiospermum Greene. Stems slender, much branched, 15-20 cm. tall, the branches very slender, threadlike, glabrous; leaves nearly sessile, linear, glabrous, 1-2 cm. long, 1-2 mm. wide; flowers axillary, minute, on thread-like pedicels 5-6 mm. long in fruit; sepals 1.5 mm. long, soon reflexed, these and the ovary minutely puberulent with appressed hairs; petals white, becoming rose-purple, 2-2.5 mm. long, broadly obovate;

stamens and style erect, subequal to the petals; ~~pods~~ capsules 5-7 mm. long, mostly subequal at both ends, constricted between the seeds; seeds 1.5 mm. long, *finely puberulent*, egg-shaped.

A southern California species reaching its northern limit in our area: Latah Co., *Piper 1633*; Fish Lake, 6000 ft., *Epling and Houck 9614*.

*3. G. ramosissimum* T. & G. Baby's Breath. A much branched annual 10-40 cm. tall, with zigzag smooth stems and very slender filiform branches about the diameter of a fine needle, the internodes 1-3 cm. long; leaves nearly sessile, linear, glabrous, 1-2 cm. long, 1-2 mm. wide; flowers axillary, minute, on thread-like pedicels deflexed and *2-3 mm. long* at maturity; sepals 1.5 mm. long, quickly reflexed, these and the ovary minutely puberulent with appressed hairs; petals white, broadly obovate, *1.5 mm. long*, spreading, then erect and touching, becoming rose-purple; stamens and style erect, subequal to the petals; ~~pods~~ capsules 5-7 mm. long, somewhat larger towards the apex, constricted between the seeds; seeds about 1.3 mm. long, egg-shaped, *smooth*, not puberulent.

Occasional in dry hard ground along trails or on dry slopes throughout our region but inconspicuous. Simulates *Epilobium paniculatum* though smaller flowered.

*4. G. Helleri* Rydb. A low slender annual *clothed throughout with spreading* straight short hairs, the stems 10-30 cm. tall; leaves linear, 8-20 mm. long, 1-2 mm. wide, tapering at the base, subsessile; flowers axillary on pedicels 1-2 mm. long or less; sepals 1.2 mm. long, ovate, soon reflexed; petals scarcely 1 mm. long, white, then pink; mature capsule 9-11 mm. long, .7 mm. wide, *even, subsessile*, *clothed with spreading hairs*; seeds 1 mm. long, narrowly obovate, *finely puberulent*.

Forest, Nez Perce Co., *Heller 3433* (type); may extend into our region.

## 7. Clarkia Pursh.

Erect annual, the stems brittle, often with exfoliating flaky epidermis, the leaves alternate. Flowers showy, in racemes. Sepals 4, remaining united except along one suture and at the base; calyx tube prolonged above the ovary. Petals rose-purple, 4, narrowed at the base to a narrow sometimes obscure claw. Stamens 4, with 4 alternate staminodia. Style 4-lobed at the summit. Capsule 4-angled, 4-chambered, opening by 4-valves. Seeds angled.

| | |
|---|---|
| o Petals deeply three-lobed; only the margins of the flattened 4 apex of the seed papillose | 1. C. pulchella |
| o Petals entire; surface of both flattened apex 4 and base of seed papillose | 2. C. rhomboidea |

1. C. pulchella Pursh. A showy graceful herb 5-40 cm. tall, simple or branching above; leaves sessile, linear, 3-5 cm. long, 2-5 mm. wide, puberulent, entire; racemes leafy, the buds nodding, on pedicels 3-4 mm. long, increasing to 5-6 mm. in fruit; calyx 12-15 mm. long, reflexed in flower, puberulent; petals rose-purple, 15-30 mm. long, deeply 3-lobed in the upper part, the lobes 5-8 mm. long, attenuate below to a toothed claw; stamens rose color, 10 mm. long; stigmas white, prominent; capsules ascending or erect, 4-angled, scarcely 2 mm. in diameter, puberulent, 1.5-2 cm. long; seeds brown, 1 mm. long, the margins of the flattened apex and and the sutre crowned with a row of papillae.

Frequent at lower elevations in dry ground on outcrops or gravelly slopes, and along roadways. Type coll. by Lewis on Clearwater R.

2. *C. rhomboidea* Dougl. Stems 15-30 cm. (rarely 50 cm.) tall, simple or branching, crisply puberulent; leaves mostly elliptical, 1-4 cm. long, narrowed at the base to a petiole 4-6 mm. long; flowers few, the buds nodding, borne on pedicels 3 mm. long, 4-5 mm. long in fruit, each subtended by a sessile leaflike bract; calyx-lobes 6-8 mm. long, acute, sparsely puberulent, spreading then reflexed; petals rose-purple with a darker red spot on the claw, 8-10 mm. long, rhombic or rhombic-ovate, *not lobed*, narrowed to a claw 1-3 mm. long, spreading; stamens and style subequal, 5-6 mm. long; capsule erect, 1.5-2 cm. long, appressed-hirtellous, 4-angled, 2.5 mm. in diameter, seeds angular, 1.5 mm. long, the sutre *and the entire surfaces of the flattened apex and base papillose*. =/

Occasional at low elevations in dry ground.

## Halorragidaceae. Water Milfoil Family.

Perennial aquatic or amphibious herbs with alternate, opposite or whorled leaves, which when submerged in water are often finely divided. Flowers perfect or unisexual, sessile in the axils of leaves. Sepals 2-4. Petals of the same number, small, often wanting. Stamens 1-8. Ovary inferior, angled or winged, the calyx-tube adherent to it, consisting of 1-4 somewhat united carpels. Fruit a nutlet or drupe.

o Stems more or less floating, the submerged leaves
4 pinnatifid into filiform segments; stamens 4-8 1. Myriophyllum

o Stems more or less erect, the submerged leaves
4 entire, whorled; stamen 1 2. Hippuris

### 1. Myriophyllum (Vaill.) L. Water Milfoil.

Stems usually floating, with the submerged leaves finely pinnatifid, those submerged being entire or lobed. Flowers usually emersed, the uppermost usually staminate, the lowermost pistillate, those intermediate perfect. Stamens 4-8. Fruit bony, indehiscent but splitting into 2-4 angled nutlets.

o Bracts pinnatifid, pectinate 1. M. verticillatum
o Bracts entire or denticulate 2. M. spicatum

1. M. verticillatum L. var. pectinatum Walbr. Leaves in whorls of 4 or 5, 1-3 cm. long, pinnately divided into 15-20 filiform segments; flowers subtended by leaf-like but greatly reduced pinnatifid bracts 3-8 mm. long, forming a slender interrupted spike, sepals scarcely 2 mm. long.

Marshes, Kootenai Co., Leiberg 88.

2. M. spicatum L. var. exalbescens (Fern.) Jeps. Leaves in whorls of 3 or 4, 1-3 cm. long, pinnately divided into 15-20 filiform segments; flowers in axillary clusters, subtended by entire ovate bracts 1-2 mm. long, forming a slender interrupted spike; sepals scarcely 2 mm. long.

Lake Pend Oreille, Leiberg 586.

### 2. Hippuris L. Mare's Tail.

Stems simple erect with whorled simple entire leaves. Flowers perfect, calyx not toothed, the rim entire. Petals small or none. Stamen 1, inserted on the calyx margin. Ovary 1-chambered, forming a 1-seeded nutlet.

1. H. vulgaris L. → Stems 30-60 cm. long or more, more or less erect or ascending; not floating, the emersed leaves spreading, 1-2 cm. long, 1-2 mm. wide, entire, 6-10 in a whorl, those submerged flaccid, 3-5 cm. long or more; flowers several in the axils, sessile, the stamen 1.5 mm. long, about twice the length of the calyx; nutlet ovoid, 1.5 mm. long, its walls porous.

In shallow water along lake shores or in boggy places which may dry out.

no ¶ → Priest Lake, Piper 3737; Lake Pend Oreille, Leiberg 511; bog, Bonner's Ferry, Epling; Upper Priest Lake, Epling 7405.

## Loasaceae. Loasa Family.

Herbs with opposite or alternate leaves, without stipules, the herbage rough, sandpaper-like. Flowers perfect (showy and solitary in the axils in our species), regular. Sepals 4 or 5. Petals 4 or 5, yellow, ~~or red.~~ Stamens numerous, the outer filaments sometimes petaloid. Pistil 1, the ovary wholly inferior, 1-chambered. Fruit a capsule.

### Mentzelia L. Stick Leaf.

Characters of the family with sepals 5; petals 5 or seemingly 10 by reason of the petal-like outer filaments or staminodia, ~~yellow.~~ Stamens and petals seated on the calyx-tube. Styles 3. Capsule with 3 parietal placentae.

O Petals 5-6 cm. long, showy 1. M. laevicaulis

O Petals 2.5-3 mm. long 2. M. dispersa

1. M. laevicaulis (Dougl.) T. & G. Blazing Star. An erect branching annual 40-60 cm. tall with shining white stems which are minutely roughened, internodes 3-4 cm. long; leaves sessile, 4-6 cm. long, lanceolate in outline, sharply pinnatifid half way to the midrib, both surfaces very rough; flowers showy, borne in the upper axils, on pedicels 5-8 mm. long; calyx-tube scabrous, the sepals smooth, narrowly lanceolate, 2.5 cm. long, petals bright lemon yellow within, paler without, 5-6 cm. long, 10-12 mm. wide, lanceolate, acute, narrowed at the base; stamens 3-4 cm. long; capsule 3-3.5 cm. long, widest at the apex, the sepals deciduous, leaving at the apex a free margin 2-3 mm. long.

An occasional entrant along rights of way or in waste places.

2. M. dispersa S. Wats. Slender annual herbs 10-40 cm. tall with shining-white minutely puberulent stems, freely branched; leaves various, those toward the middle mostly oblanceolate, 2.5-3 cm. long, entire or sparingly dentate, the upper mostly ovate or oval, 1-1.5 cm. long, mostly entire, all shortly hispid and glandular, ashy; flowers in terminal cymes, sessile, the ovaries linear, 18-20 mm. long, 3-angled, even, glandular and hispid with spreading hairs, the calyx-teeth 1-1.5 mm. long, reddish, subulate; corolla 2.5 mm. long, corn yellow; seeds .7 mm. long, 3-angled, each angle grooved, the top and bottom flat, hence roughly cubical, gray.

On rocky ledge, Granite Sta.; Coeur d'Alene Mts.; Lake Waha; Cedar Mt.

## Linaceae. Flax Family.

Ours perennial herbs with alternate entire sessile leaves, without stipules. Flowers showy, perfect, regular, 4-6 parted. Sepals 5, imbricate, persistent. Petals 5, convolute in the bud, early deciduous. Stamens joined at the base. Pistil 1, with superior ovary or usually 5 united carpels. Fruit an incompletely 1-chambered capsule opening down the septa~~d~~ by twice as many valves (10) as there are carpels.

### Linum (Tourn.) L.

Characters as above.

1. *L. Lewisii* Pursh. Blue Flax. Stems slender, 60-70 cm. tall, branching only above, the branches nearly erect, the herbage *glabrous and glaucous* throughout; leaves linear, 1.5-3 cm. long, 2-3 mm. wide; flowers borne on slender pedicels 1-2 cm. long in the uppermost axils; sepals ovate =/ rotund, 5 mm. long, the margins thin; petals *blue*, obovate, wedge-shaped, 15-18 mm. long; stamens 10-12 mm. long; capsule twice the length of the persistent clasping sepals, globose.

Occasional at higher elevations on rocky outcrops. Upper Priest R., 4800 ft., *Anderson*; Pend Oreille R., *Lyall*. One of the best known of the western wild flowers, it bears the name of its first collector, Capt. Meriwether Lewis of the Lewis and Clark Exp., 1804-06.

## Balsaminaceae. Jewel-weed Family.

Herbs with watery more or less translucent stems and swollen nodes. Leaves alternate, simple, without stipules. Flowers perfect, irregular, zygomorphic. Sepals 3 or 5, petaloid, the posterior one usually spurred or at least saccate at the base. Stamens 5, the anthers more or less united. Pistil 1, the ovary 5-chambered, superior. Fruit a capsule, elastically dehiscent.

### quite glabrous Impatiens L. Touch-me-not.

Annual herbs as described above. Petals ~~apparently~~ 3, dissimilar, the laterals 2-lobed.

O Flowers with spurs 5-10 mm. long 1. I. aurella

O Flowers without a spur, the lower petal merely saccate 2. I. ecalcarata

1. I. aurella Rydb. Jewelweed. A pale green [redacted] herb as much as 1 m. tall, much branched; leaf blades 4-6 cm. long, ovate or oval, obtuse, rounded or narrowed at the base, coarsely toothed, the teeth again serrate, petioles 1-2.5 cm. long; flowers showy in drooping axillary clusters 3-7 cm. long, the bracts awl-shaped, 3-4 cm. long; sepals usually pale yellow, orbicular, tipped with a short cusp, 5-6 mm. in diameter; petals orange-yellow, the upper petal transversely oblong, 5 x 8 mm., to subrotund and 6-7 mm. in diameter, sometimes spotted with red, the laterals 15 mm. long, bifid, the upper lobes 3-4 mm. long, truncate, the lower about 14 mm. long, obovate or wedge-shaped and obliquely notched with a twist near the middle, the sac 10-15 mm. long, 7-10 mm. wide in the throat, the free portion about 5 mm. long, obtuse, narrowed abruptly to a spur 5-10 mm. long, strongly recurved and usually pressed against the sac; stamens 3 mm. long, opening in the bud, the filaments expanded, lightly joined, forming a column around the pistil, humped at the apex, soon falling, anthers 1.5 mm. long, somewhat arrow-shaped but obtuse; pod 1.5- 2 cm. long, cylindrical or sub-clavate, glabrous and green; seeds 3-5 mm. long, flattened-elliptical, becoming dull black. [redacted] =/

Rare; in moist shaded bottoms or bogs. The second collection is the type.

no H → Lamb Cr., Epling and Houck 10240; MacAbee's Ranch, Priest R., Valley; MacDougal 20; [redacted] Mud Lake, Sandberg 738; Moyie R., Lyall; Krauter's Camp, Ellison; Priest River, Epling and Putnam; Granite Station, Epling.

2. I. ecalcarata Blankinship. A pale green herb as much as 1 m. tall; leaf-blades 4-6 cm. long, ovate or oval, obtuse, rounded at the base, coarsely toothed, the teeth rounded, petioles 1-2.5 cm. long; flowers showy, in drooping axillary cymes 3-4 cm. long, bracts awl-shaped, 3-4 mm. long; sepals pale yellow, orbicular, tipped with a short cusp, 5 mm. long; corolla orange-yellow, the upper petal orbicular, 6-7 mm. long, the laterals 15 mm. long, bifid, the upper lobes 2-2.5 mm. long, truncate, the lower 10-12 mm. long, oblong, with a twist near the base, the sac obtuse, not spurred; stamens 3 mm. long opening in the bud, the filaments expanded, lightly joined and forming a column around the pistil, humped at the apex, soon falling; pistil 3 mm. long; pod 2 mm. long, cylindrical or subclavate, glabrous and green; seeds 3 mm. long.

Rare; in moist shaded bottoms ~~or bogs~~; very similar to I. aurella save in absence of the spur. →

no 4 → Near Kellogg, Epling and Houck 10076; "Fort Colville and Rocky Mts.," Lyall. → Though these Fort Colville specimens were all credited to Lyall and so appear on the labels they were taken by John Buttle (cf. Piper, Fl. Wash. 17. 1906).

## Ericaceae. Heath Family.

Shrubs, sometimes herb-like and prostrate, ~~or trees,~~ with alternate, simple, leathery and persistent or deciduous leaves without stipules. Flowers perfect, symmetric or assymmetric, solitary or in corymbs. Sepals 4 or 5, usually persistent on the fruit. Corolla with 4-5 petals usually united, ~~either~~ saucer-shaped or globose, sometimes free. Stamens twice as many as the corolla lobes, hypogynous or epigynous, the anthers opening by terminal pores or slits, the sacs frequently bearing prong-like appendages. Ovary superior or inferior, 2-10-chambered. Fruit a berry, ~~or~~ drupe, or capsule, the latter loculicidal or septicidal, opening either from the base or from the apex. Seeds not numerous. Leaves deciduous in Rhododendron, Vaccinium and Menziesia.

0 Ovary inferior; fruit a berry 2

2 Prostrate, creeping shrubs with slender stems

4 Petals free, recurved; berry red; leaves 6 glabrous and glaucous — 1. Oxycoccus

4 Petals united, berry white; leaves hispidulous — 2. Chiogenes

2 Erect shrubs often with angled stems; corolla urn-shaped — 3. Vaccinium

0 Ovary superior; fruit a small capsule, less often 4 berry-like

2 Leaves 2-4 mm. long, overlapping, crowded on 6 the stems in 4 ranks; flowers axillary — 4. Cassiope

2 Leaves not as described above

4 Low prostrate plants; fruit a drupe or berry-8 like; flowers solitary in the axils =1

6 Leaves obovate; filaments hairy — 5. Arctostaphylos

6 Leaves ovate or rotund, not obovate; filaments 10 glabrous — 6. Gaultheria

4 Erect or ascending shrubs or, if procumbent, 8 heather-like with linear leaves; fruit a capsule; flowers in umbels or corymbs

6 Low procumbent shrubs with linear leaves 10 1-1.5 mm. wide — 7. Phyllodoce

6 Erect or ascending shrubs with broader leaves

8 Petals distinct, not united; lower surface 12 of leaves bearing numerous resin dots — 8. Ledum

8 Petals united; lower surface of leaves not 12 glandular-punctate

10 Corolla shallow, saucer-shaped, the 14 lobes more or less spreading

12 Corolla rose-purple; leaves glaucous
16 beneath 9. Kalmia

12 Corolla white; leaves pale green
16 beneath, not glaucous 10. Rhododendron

10 Corolla urn-shaped, ovoid, narrowed at the
14 apex

12 Capsule loculicidal; leaves linear,
16 revolute, persistent 11. Andromeda

12 Capsule septicidal; leaves obovate,
16 deciduous 12. Menziesia

## 1. Oxycoccus (Tourn.) Adans.

A prostrate creeping slender-stemmed herb with alternate, persistent, leathery leaves. Flowers elevated on slender pedicels. Sepals 4. Petals 4, free, strongly recurved. Stamens 8, the anther-sacs prolonged into tube-like appendages. Ovary 4-chambered. Fruit a red berry.

1. O. palustris Pers. Small Cranberry. Perennial with internodes .5-1 cm. long; leaf-blades nearly sessile, 4-7 mm. long, oval, obtuse at both ends, rounded at the base, the upper surface somewhat glossy, the lower waxy-white, the margins entire, revolute; flowers in pairs at the tips of branches, erect, the mature pedicels 2.5-3 cm. long; sepals minute, semicircular; petals rose-purple with a deeper spot at the base, oblong-lanceolate, obtuse, 7-8 mm. long; stamens 5 mm. long, the filaments minutely puberulent; fruit subglobose or pear-shaped, 6-8 mm. in diameter. (Vaccinium Oxycoccus L.).

Rarely found in our region, creeping in sphagnum bogs. Priest Lake, Epling 7712; mouth of the Thorofare, Piper 3722; Rehder Cr., 2850 ft., Leiberg 2744.

## 2. Chiogenes Salisb.

Prostrate herbs with alternate, persistent leathery leaves. Flowers solitary in the axils, each subtended by 2 bracts. Sepals 4. Corolla campanulate, 4-lobed; stamens 8, the anthers awnless, the sacs not prolonged into tube-like appendages. Ovary 4-chambered. Fruit a white berry.

1. C. hispidula T. & G. Stems covered with brown appressed hispid hairs; leaves 4-8 mm. in diameter, broadly oval, nearly orbicular, leathery, the margin entire, the upper surface somewhat glossy, the lower pale, sprinkled with short brown hairs, petioles .5 mm. long; flowers on pedicels 2 mm. long; corolla 1.5-2 mm. long; berry globose, white, mealy, hispidulous with rusty hairs; seeds 1.1 mm. long.

Cold woods. →

Priest Lake, Piper 3718; Lake Pend Oreille, Leiberg 2786.

## 3. Vaccinium L.

Shrubs with alternate deciduous leaves and often with angled stems. Flowers solitary or 2-4 together in the axils, borne on drooping pedicels, usually becoming erect in fruit. Calyx lobes 4-5, minute, commonly forming a disc. Corolla urn-shaped, the lobes reflexed, 4-5, white or pinkish. Stamens 8-10, the filaments glabrous, the anthers bearing on the back two upwardly curved prongs, each sac prolonged into a tube like appendage. Ovary 4-5-chambered. Fruit a berry, bearing a circular depression at the apex.

0 Calyx lobes wanting, the limb forming a more or less
4 undulate skirt at the base of the corolla, ~~which~~
appear~~s~~ing as a circular ridge on the top of the fruit

2 Leaves prevailingly obovate or broadly oblanceolate, broadest
6 above the middle; fruit bluish-black — 2. V. caespitosum

2 Leaves oval or ovate, broadest at the middle or
6 towards the base

4 Shrubs 40-90 cm. tall or more

6 Leaves broadly oval, entire; fruit blue
10 black bearing a white waxy bloom — 3 V. ovalifolium =|

6 Leaves ovate or elliptical, irregularly
10 toothed; fruit wine-colored (rarely red
or white) with no bloom or a light one — 4. V. membranaceum

4 Undershrubs 15-40 cm. tall, with usually
8 decumbent stems and ascending twiggy branches

6 Leaves commonly 6-12 mm. broad, on slender
10 petioles 1 mm. long; fruit blue-black,
6-8 mm. in diameter — 5. V. myrtillus

6 Leaves commonly 4-7 mm. broad, nearly
10 sessile; fruit bright-red, very rarely
purple, 4-6 mm, in diameter — 6. V. scoparium

0 Calyx 5-lobed, the lobes small, deltoid, appearing
as such on the top of the fruit — 1. V. occidentale

1. V. occidentale Gray. Bog Bilberry. A low leafy shrub 30-40 cm. tall with stiffish ascending branches, the bark smooth, mahogany color, the branchlets reddish, the internodes 3-10 mm. long; leaf-blades 1-2 cm. long, 4-10 mm. wide, pale green or reddish, leathery, oval or obovate, blunt at the apex, narrowed at the base to a petiole 1-1.5 mm. long, both surfaces smooth, the margin entire; calyx 5-parted, the lobes acute, the corolla ovoid, 3 mm. long; the fruits pendulous, blue-black with a light bloom, 4-5 mm. in diameter.

Infrequent in our region, occurring in the southern portion in high boggy meadows. Hoodoo Lake, Shattuck and Fenn; Crater Meadows, Sutton 86; Lolo Trail near Packers meadows, Kirkwood 2046; Weitas Cr., Piper 4046 (in part).

2. *V. caespitosum* Michx. Dwarf Bilberry. A densely leafy low shrub 15-50 cm. tall, the stems reclining or prostrate, covered with greyish mahogany colored bark, finely fissured, the younger bark flaking, the branches ascending or erect, stiffish, often waxy, the internodes 2-10 mm. long; leaf-blades 1.5-3 cm. long, obovate to oblanceolate, obtuse at the apex but narrowed and frequently *acutish at the tip*, narrowed below the middle and more or less wedge-shaped, bluish breen and somewhat waxy above, paler beneath, the *veins prominent, the margins finely serrate*; flowers drooping, the calyx a shallow inconspicuous cup, the margin undulate, subentire; corolla pinkish or white, ovoid, 4 mm. long, the lobes scarcely 1 mm. long; fruit *pendulous, bluish-black with a light bloom*, 5-7 mm. in diameter, depressed globose. (*V. c.* var. *cuneifolium* Nutt.).

Infrequent, occurring throughout our range in rather boggy meadows usually in sphagnum, commonly associated with *Betula pumila*. Hoodoo Lake; Lamb Creek, 3000 ft.; near Oxford R. → S., Moscow Mt.; St Maries R.; Fish Cr.; Emerald Cr.; Partridge Cr.

3. V. ovalifolium Smith. Blueberry. An erect shrub .5-1 m. tall, the stems ascending, or reclining at the base, branching chiefly above, the bark greyish brown, shedding somewhat, the branchlets smooth and often red or brown; leaf blades 2-4 cm. long, thin, variable in size on the same plant, broadly oval, rounded at both ends and quite blunt, the margins entire, both surfaces glabrous, the lower paler, the petioles 1-2 mm. long; flowers inconspicuous, pendulous, the calyx-limb undulate, entire, the corolla 7-8 mm. long, ovoid; fruit erect, on pedicels about 5 mm. long, deep blue with a waxy bloom, 7-12 mm. in diameter, globose, the depression 1 mm. or less deep, divisions 5, the seeds curved, angular, 1-1.5 mm. long.

On the floor of semi-mature forest in the north, there abundant locally. Priest Lake; Upper Priest R., 2000 ft.; Lion Cr., 3000 ft.; Coeur d'Alene Mts.

4. *V. membranaceum* Dougl. Huckleberry. A shrub commonly about 1 m. tall, less at higher elevations, the stem erect or reclining at the base, branching chiefly above, the bark olivaceous, somewhat shredding, branchlets green, less often red, the internodes 5-20 mm. long; leaf-blades 1.5-5 cm. long, variable in size on the same plant, thin, bright green, elliptical or ovate, usually wider near the base, mostly sub-acute at the tip, more or less rounded and narrowed at the base, the margin obscurely serrate, both surfaces glabrous, on petioles 1-2 mm. long; flowers inconspicuous, pendant, the calyx limb undulate, subentire, the corolla pearly-white tinged with rose, 3.5-4.5 mm. long, depressed-globose, the lobes scarcely .5 mm. long; fruit erect, usually the color of port or burgundy or sometimes nearly black, or at high elevations sometimes bright red, rarely ivory-color, bearing scarcely any bloom.

Common throughout our region especially on dry open slopes, in old burns.

Whortleberry

5. V. myrtillus L. ~~[illegible]~~ Low shrubs 15-25 cm. tall, with decumbent often somewhat trailing stems, rather diffusely branched, the branches ascending, forming a small bush, angled, green, smooth, the internodes prevailingly shorter than the leaves; leaves somewhat leathery, veiny, ovate, or sometimes oval, mostly broadest below the middle, 1-2 cm. long, 7-12 mm. wide, mostly obtuse, rounded at the base, borne on petioles .5-1 mm. long, the margins finely toothed when viewed under a lens, glabrous on both surfaces; flowers pendulous, the calyx limb entire but undulate, about .5 mm. wide, the corollas depressed globose, 3-4 mm. broad, pearly; fruits wine color, 6-8 mm. in diameter with scarcely any bloom, pendulous at maturity. (V. oreophilum Rydb.).

no#

Frequent on high ridges commonly in association with Abies lasiocarpa or Pinus albicaulis, often growing with high altitude forms of V. membranaceum from which it may be distinguished by the smaller, more depressed corollas and somewhat smaller leaves; from V. scoparium by the fruit color and corolla shape as well as habit, the latter being much more twiggy. The fruits often have a high, very fine flavor and aroma.

6. V. scoparium Leiberg. Grouseberry. A low shrub 10-30 cm. tall, usually forming small patches, woody and reclining at the base, with numerous stiffish ascending green stems, the branchlets angled, the internodes 3-8 mm. long; leaf-blades nearly sessile, ovate or elliptical, 10-15 mm. long, pale green, acute, somewhat wider towards the base and narrowed or rounded, the margins finely serrate; ~~flowers solitary in the axils, the~~ calyx limb undulate, subentire, the corolla ovoid, 3.5-4 mm. long, the lobes less than 1 mm. long, borne on deflexed pedicels about 2 mm. long, which increase somewhat in fruit; berry pendulous, bright red (rarely blue-black), 4-6 mm. in diameter, flattened globose, with scarcely any bloom. (V. microphyllum (Hook.) Rydb.).

Common throughout our region at high elevations on open rocky slopes and ledges, on old talus slopes or in dry burns.

## 4. Cassiope D. Don.

Low shrubs with small ~~persistent~~ leaves ~~overlapping on the~~ stem in four ranks. Flowers axillary, nodding. Sepals 5. Corolla bell-shaped, 5-lobed. Stamens 8-10, included, anthers attached to the filaments near the apex, the sacs bearing recurved prongs. Ovary 4-5-chambered. Fruit a 4-5-valved loculicidal capsule.

1. C. Mertensiana (Bong.) D. Don. White Heather. A low tufted undershrub with ascending branches, covered by the imbricated very fragrant foliage; leaves 2-4 mm. long, ~~thick and leathery,~~ glabrous, triangular-ovate, acute, ridged along the back hence triangular in cross-section, auricled at the base with two short prongs; flowers few, nodding, on slender red pedicels 8-10 mm. long; sepals 3 mm. long, imbricated, obtuse; corolla white, 6 mm. long; capsule 4 mm. long.

On barren rocky mountain tops in the Selkirk range. Hunt Cr., P. R. Res., 5400 ft.; Chimney Rock, 7000 ft.; Roman Nose Mt., 7000 ft.; Pend Oreille Mt.

## 5. Arctostaphylos Adans.

Shrubs (ours prostrate) or small trees. Flowers perfect, in terminal racemes. Sepals 5, persistent. Corolla urn-shaped, 4-5 lobed. Stamens 8-10, included, the filaments dilated and hairy at the base; anthers bearing recurved prongs. Ovary 4-10 chambered. Fruit a berry-like drupe, the pulp rather dry or mealy at maturity, enclosing several 1-seeded, more or less coalescent nutlets.

1. A. Uva-ursi (L.) Spreng. var. coactilis Fern. & Macbr. Bearberry. A prostrate mat-forming undershrub, 20-40 cm. tall, much branched, the mature bark dark chestnut-brown, flaking away, the branchlets puberulent, reddish; leaves 1-2 cm. long, 6-10 mm. wide, very leathery, obovate, often slightly notched at the apex, narrowed to a petiole 2-3 mm. long, both surfaces glabrous, the upper polished and dark-green, the lower paler; flowers several on short lateral branches 4-8 mm. long, subtended by ovate, acute bracts 2-3 mm. long; calyx-lobes pinkish, rounded; corolla pinkish, ovoid, 4-5 mm. long, the orifice small, the lobes less than .5 mm. long; stamens and style included; fruit bright, mealy within, flattened at the stem end, 7-9 mm. in diameter.

Frequent on dry ledges and outcrops throughout our region.

## 6 Gaultheria (Kalm) L.

Low undershrubs or perennial herbs with flowers solitary in the axils or in short axillary racemes. Sepals 5. Corolla urn-shaped or campanulate. Stamens 10, included; the filaments dilated at the base. Ovary 5-chambered. Fruit berry-like, the capsule being enclosed by the fleshy calyx at maturity.

○ Leaves 1.5-4 cm. long; stems villous with slender
4 soft hairs; fruit bristly 1. G. ovatifolia

○ Leaves 8-20 mm. long; fruit glabrous; stems glabrous 2. G. humifusa

1. G. ovatifolia Gray. Creeping Wintergreen. A prostrate evergreen herb, the leaves commonly dropped the second year, the rootstocks slender, creeping, the branches often numerous, spreading fan-shaped over the ground, bearing soft and at length reddish hairs; leaves 1.5-4 cm. long, 1.5-3 cm. wide, leathery, smooth, somewhat glossy, broadly ovate or the smaller nearly orbicular, mostly obtuse, rounded or even somewhat cordate at the base, the margins lightly serrulate, the petioles 1-2 mm. long, hairy like the stems; flowers subtended by several small bracts, the peduncles 3-6 mm. long; calyx woolly, the lobes ovate-triangular, acute with thin margins, 2 mm. long; corolla white, 5-6 mm. long, bell-shaped, the free tips recurved; anthers 1.5 mm. long, dilated at the base; fruit bright red but not glossy, 5-6 mm. in diameter, bristly; lobules 5; seeds numerous, less than 1 mm. long, brown.

Infrequent, growing in ~~the~~ deep ~~of~~ shaded woods ~~throughout our region~~. The fruit is agreeable to taste and slightly aromatic. Forks of St. Maries R., 5200 ft., Leiberg 1153; Priest Lake, Piper 3159; Upper Priest R., 300-3500 ft., Epling 7118; Pend Oreille R. , Lyall; Pelky Cr., Ellison 92; Bloomer Cr., Epling and Putnam.

*2. G. humifusa* (Grah.) Rydb. A low tufted perennial herb with evergreen leaves, 3-15 cm. tall, the rootstocks slender, creeping, the stems *glabrous or puberulent*, slender; leaves leathery, 8-20 mm. long, oval or rotund, the *margins entire*, both surfaces smooth, rather dull; flowers subtended by several small bracts, the peduncles 4-5 mm. long; calyx glabrous, the lobes triangular-ovate, acute, 1.5 mm. long; corolla whitish, 3 mm. long, the free tips recurved; fruit scarlet, *glabrous*, 5-6 mm. in diameter. (*G. myrsinites* Hook.).

At high elevations on mountain tops. Graves Peak, *Shattuck and Fenn*; near Oxford Rgr. S., *Epling 9682*.

## 7. Phyllodoce Salisb.

Low densely branching shrubs with linear leaves. Flowers in terminal false umbels. Sepals 5, imbricate, persistent. Corolla campanulate or urn-shaped, 5-lobed. Stamens 10, included. Ovary 5-chambered. Fruit a septicidal capsule.

o Corolla yellowish, contracted at the throat;
  4 leaves 4-8 mm. long 1. P. glanduliflora

o Corolla rose-purple, not contracted at the throat;
  4 leaves 8-10 mm. long 2. P. empetriformis

1. P. glanduliflora (Hook.) Cov. Yellow Heather. A low shrub 15-30 cm. tall, much branched, the branches reclining, the bark flaking and falling away, the leafy branchlets erect, marked by the old leaf-bases; leaves green and smooth, densely crowded, spreading, 4-10 mm. long, 1.5 mm. wide, blunt, the margins strongly but closely revolute, only the midvein showing beneath, obscurely glandular-serrulate; flowers few from the uppermost axils, yellowish or greenish white; sepals 3-4 mm. long, erect, acute, glandular-pubescent and viscid; corolla ovoid, 6 mm. long, tapering towards the tip, the lobes scarcely 1 mm. long; stamens and style included; capsule not seen.

On the highest peaks in exposed places in crevices.

2. P. empetriformis (Sm.) Don. Purple Heather. A low shrub commonly forming dense heather-like patches, 30-50 cm. tall, the foliage deep green, the branches ascending at the tips, bark grey, roughened by old leaf-bases, at length smooth; leaves densely crowded, 10-15 mm. long, 1.5 mm. wide, blunt, dark green and shining, spreading, the margins strongly but closely revolute, only the midvein showing beneath, obscurely glandular-serrulate; flowers several from the uppermost axils, erect, ~~forming a false umbel~~ the pedicels 2 cm. long, slender, glandular, purplish red; sepals 1.5-2 mm. long, ovate, obtuse, reddish, glabrous, finely ciliate; corolla 5 mm. long, rose-purple, campanulate, the lobes 1.5 mm. long; stamens and style included; capsule subglobose, 3.5-4 mm. long, glandular, the valves opening from the apex.

Frequent on the highest peaks in exposed places, rarely descending lower.

## 8. Ledum L.

racemes

Erect shrubs with alternate, leathery persistent leaves. Flowers in terminal ~~corymbs~~. Sepals 5, persistent. Petals 5, imbricate in the bud, spreading in anthesis. Stamens, 5-10, more or less erect, ovary 5-chambered. Fruit a 5-valved, septicidal capsule.

1. L. glandulosum Nutt. Labrador Tea. A rather pretty shrub 60-80 cm. tall, forming clumps, the old bark smooth, the young bark checking, the branchlets glandular pubescent; leaves in terminal clusters persisting two years, with a resinous pungent odor when crushed, 1.5-8 cm. long, 1-2.5 cm. broad, oval, obtuse at both ends or rounded-subcordate in some forms, on petioles .5-1.5 cm. long, the margins entire, the upper surface green and somewhat glossy, the lower silvery white, glandular-punctate; ~~flowers in terminal~~ racemes 1-3 cm. long, the bracts deciduous; sepals 1.5 mm. long, obtuse, glandular-fimbriate; petals white, oval, 6-7 mm. long spreading; stamens 10, ascending, slightly exceeding the petals, pubescent at the base, mature pedicels 1-2 cm. long, slender, drooping, glandular; capsules oblong-ovate, 3-4 mm. long, glandular-punctate, ~~dehiscent from the base along the divisions~~ tipped by the persistent style, commonly persisting the second year.

Occasional in the southern part of our range in boggy places and meadows usually at higher elevations; not seen in the north; suspected of being poisonous to sheep who ordinarily avoid it in our area. Near Oxford R.S.; Scurvy Mt., 5800 ft.; Revett Lake, 5000-6000 ft.; Twin Cr.; Snow Peak, 5500 ft.; near Pierce; Bovill.

## 9. Kalmia L.

Erect shrubs with alternate, opposite or whorled leathery persistent leaves. Flowers in terminal or axillary corymbs or umbels. Sepals 5, persistent. Corolla saucer-shaped, pink or white, with 10 pouches below the lobes and sinuses. Stamens 10, the anthers at first contained in the pouches whence they are released by the springing of the elastic filaments. Ovary 5-chambered. Fruit a 5-valved, septicidal capsule.

1. K. polifolia Wang. var microphylla Hook. Laurel. A low sometimes prostrate shrub 20-30 cm. tall, usually forming clumps, the old bark smooth, grayish, the branchlets glabrous, brown; leaves ~~leathery~~, 1.5-2.5 cm. long, 6-12 mm. wide, oval or elliptical, acute or obtuse at both ends, the margin entire, the upper surface green and glossy, the lower glaucous but not glandular-punctate, very smooth, on petioles 1-2 mm. long; flowers several, ~~in a terminal corymb~~, erect; ~~the~~ sepals ovate, obtuse, 3 mm. long; ~~the~~ corolla rose-purple, 10-15 mm. across, the lobes at first erect, then spreading, each lobe and sinus provided with a small pouch in which the purple anther rests; mature pedicels 2.5-4 cm. long, glabrous, slender, the capsules flattened globose, 4.5-5 mm. in diameter, glabrous.

Near small lakes in boggy ground usually at high elevations. Priest Lake; Snow-Peak, 5500 ft.; Hoodoo Lake; Scurvy Mt., 5800 ft.; Roman Nose Peak, 7000 ft.; Lake Darling.

## 10. Rhododendron L.

Shrubs with ~~alternate~~ entire deciduous leaves crowded toward the tips of the branches. Flowers in 1-3-flowered umbels borne on second year wood just below the leaf-cluster. Sepals 5. Corolla shallow, campamulate, slightly unsymmetrical, 5-lobed, white. Stamens 10, included, the filaments hairy at the base. Ovary 5-chambered, forming a septicidal capsule.

1. *R. albiflorum* Hook. A shrub 1-2 m. tall, the branches ascending or decumbent at the base, stiffish, the lateral branches short, bark brown, finely furrowed, the new bark brown, shining, bearing reddish hairs the first season; leaves 3-8 cm. long, 1.5-2.5 cm. wide, appearing *as though whorled at the tips of the branches*, oblanceolate or elliptical, obtuse or acutish at both ends, the margins entire, both surfaces hirsute with reddish hairs in youth, becoming glabrous, the *upper surface glossy* when living, the lower pale; flowers rather showy, the pedicels 8-10 mm. long, rusty-hirsute; ~~the~~ sepals elliptical-oblong, rusty-hirsute, the margins glandular; corolla white, 18-20 mm. in diameter; capsule 7-7.5 mm. long, enclosed within the erect sepals.

Frequent in the northern part of our range forming brush with *Menziesia glabella* in subalpine burns and moist slopes, usually above 5000 ft. the glossy, more acute leaf and rugose appearance distinguish this species from *Menziesia glabella*; poisonous to sheep. Cap.

corymbs

## 11. Andromeda L.

Erect shrubs with ~~leathery persistent~~ revolute margined leaves. Flowers in terminal ~~umbels~~. Sepals 5, persistent. Corolla urn-shaped or globose. Stamens 10, included, the filaments beared, unappendaged, the anthers bearing prongs. Ovary 5-chambered. Fruit a 5-valved loculicidal capsule.

d

1. A. polifolia L. Bog Rosemary. A low rigid shrub 30-40 cm. tall, the branchlets glabrous and somewhat glaucous, becoming brown; leaves sessile, 1.5-2.5 cm. long, 2-4 mm. wide, very acute, the margins strongly revolute, the upper surface green, the lower silvery; flowers ~~in terminal corymbs,~~ erect, subtended by rather fleshy, ovate bracts 4-5 mm. long; sepals triangular, acute, 1 mm. long; corolla pink, nodding, 8-9 mm. long; mature pedicels 1.5-2 cm. long, glabrous, capsules erect, 3.5 mm. long, subglobose, splitting in the locules from the apex, the style persistent.

Priest Lake, Piper 3687.

## 14. Menziesia Smith.

Erect shrubs with alternate deciduous leaves. Flowers in terminal umbels. Sepals 4 or 5, persistent. Corolla urn-shaped, 4-lobed. Stamens usually 8, included; filaments subulate, flattened. Ovary 4-chambered; stigma 4-lobed. Fruit a septicidal 4-valved capsule.

1. M. glabella Gray. False Huckleberry. A shrub with unpleasant odor when crushed, 1-2 m. tall, the branches ascending, numerous, rebranching, the bark light brown, shredding away, the branchlets pubescent and glandular; leaves appearing in false whorls at the tips of branches, 5-8 cm. long, 2-3.5 cm. wide, oblanceolate or obovate, obtuse, often rounded, narrowed towards the base, the margin entire, ciliate, both surfaces sparingly pubescent, the upper bluish-green in shade forms, yellowish in sun forms, the lower paler; flowers ~~several in umbellate~~ clusters on very short spurs terminating the previous year's growth, drooping in flower, soon erect, the pedicels 2-3 cm. long, glandular; ~~the~~ calyx lobes 1 mm. long, hemispherical, glandular fringed; ~~the~~ corolla pinkish, ovoid, 6-9 mm. long, the lobes rounded, 1-1.5 mm. long; stamens and style included, the filaments glabrous, 5 mm. long; ovary glandular pubescent; capsules variable, 5-8 mm. long, with a few scattering glands; ~~the~~ seeds 2 mm. long, attenuate from the middle.

Common throughout our region from 3000-6000 ft., forming an important shrub in burns and on open slopes. The sun forms have an aspect much like M. ferruginea but may be distinguished by the glabrous filaments and glandular pubescent ovary; poisonous to sheep, ~~which~~ in our region generally avoid it.

## Pyrolaceae. Wintergreen Family.

Perennial herbs with alternate or opposite leaves, either green, leathery and persistent or scale-like and wholly devoid of chlorophyll, white, flesh-color or ruddy. Flowers perfect, commonly somewhat irregular, in racemes or corymbs, sometimes solitary, commonly nodding. Sepals 2-6, mostly 4 or 5, persistent or deciduous. Petals 4-5, often waxy, mostly distinct, sometimes united into a globose-tubular corolla. Stamens 6-12, the anthers opening by a pore at the apex, or longitudinally. Ovary 1-6-chambered, superior. Fruit a loculicidal capsule opening either from the apex or from the base. Seeds small, very numerous, surrounded by a very loose, translucent testa.

0 Parasitic or saprophytic herbs with scale-like leaves
4 and no chlorophyll, white, flesh-color or ruddy; roots coral-like

2 Petals free; flowers solitary or few — 1. Monotropa

2 Petals united into a globose corolla; flowers
6 numerous in an elongate raceme — 2. Pterospora

0 Herbs with green leaves not scale-like except in *Pyrola aphylla*; roots normal

2 Flowers solitary, white, not waxy, the margins
6 of the petals crinkled — 3. Moneses

2 Flowers several, whitish or purple, waxy,
6 the margins of the petals even

4 Stems leafy; flowers in corymbs, the
8 bracts wanting — 4. Chimaphila

4 Leaves basal; flowering stem bearing scales
8 only, the bracts persistent, the flowers in racemes — 5. Pyrola

## 1. Monotropa L.

Waxy-white or flesh-colored (brown or black in age) perennial ~~herbs~~ saprophytes usually more or less clustered. Proper leaves none. Flowers solitary or several in a raceme, nodding. Sepals 2-5. Petals 3-6. Stamens 6-12, the anthers kidney-shaped, opening transversely. Ovary 3-5-chambered; stigma disc-shaped. Fruit a 3-5-chambered capsule.

| | |
|---|---|
| 0 Plants waxy-white, becoming black on drying; flowers 4 solitary | 1. M. uniflora |
| 0 Plants flesh-colored or tinged with purple, becoming 4 brown; flowers 10-20 | 2. M. Hypopitys |

1. M. uniflora L. Ghost Flower. A low [redacted] saprophyte pure white and satiny, becoming black and tough when dry, the stems erect, 15-30 cm. long, brittle, numerous from a clump of buried coral-like roots, the old stems very rigid; leaves scale-like, thin, obovate, 1-1.5 cm. long, sessile; flower solitary, nodding, surrounded by an involucre of scales; petals obovate, about 1 cm. long, rounded-truncate at the apex, pubescent within towards the base; stamens shorter than the pistil, the filaments puberulent, anthers cream-color, 2 mm. wide; ~~the~~ pistil ovoid, subequal to the petals, the stigma concave, 5-lobed; capsules erect, broadly oval, splitting in the locules, 1 cm. long.

Occasional in the deep duff of shaded woods, often in the protection of an old log. Orogrande Cr.; Snow Cr.; Priest R. Exp. Sta.; Benton Cr.

2. M. Hypopitys L. Pinesap. Stems gregarious, deeply seated in the duff, 15-30 cm. tall, ~~growing from well rotted wood,~~ ~~purplish~~ rose or flesh-color when fresh, drying brown, the leaves scale-like, membranous, sessile and clasping, ovate, 8-12 mm. long, acutish; flowers nodding then erect, commonly 10-20 in a raceme 5-6 cm. long; ~~[illegible] only, mostly 4-parted~~ petals oblong, 10-11 mm. long, lightly saccate at the base, lightly involute, hispidulous on the outer surface, hairy within, the tips recurved; stamens 8-10, the filaments equal to the sepals, hispidulous; ovary ovoid, 4-5 mm. long, hispidulous, pink, the style subequal in length, the stigma fringed, concave; capsule on pedicels at length 8-10 mm. long.

Occasional in the deep duff of shaded woods; pretty but inconspicuous in its environment. Upper Priest R., 3000 ft.; Osier Ridge, 4000 ft.

## 2. Pterospora Nutt. Pine Drops.

Ruddy flesh-colored saprophytes without proper leaves. Flowers numerous in elongated racemes. Sepals 5. Petals united into a globose corolla with 5 short lobes. Stamens 10, included, the anthers longitudinally dehiscent. Ovary 5-chambered, forming a 5-valved capsule.

**1. P. Andromeda** Nutt. Roots densely matted, forming balls, the stems rigid, reddish and wand-like, 20-90 cm. tall, leafless or with a few scarious scales 1-3 cm. long at the base, very glandular and viscid above; racemes commonly 20-30 cm. long, the flowers nodding, on recurved pedicels 1-1.5 cm. long, the bracts brownish, linear, 8-10 mm. long, their margins glandular; calyx-lobes purplish-red, lanceolate, obtuse, 4 mm. long; corolla sordid-white or flesh-color, ovoid, 7-8 mm. long, the lobes 2-2.5 mm. long, recurved; stamens subequal to the globose 10-lobed ovary and appressed to it, the filaments filiform, the anthers tailed at the base, the appendages 1 mm. long; style 2 mm. long, the stigma capitate; capsule flattened-globose, 12 mm. in diameter.

Frequent in the duff of shaded woods.

## 3 Moneses Salisb. Star Flower.

Herbs with slender rootstocks and persistent leathery opposite leaves. Flowers solitary, nodding, sepals 5. Petals 5, white. Stamens 8-10, tubular at the apex. Ovary 4- or 5-chambered, the style straight, erect, with 5 subulate lobes, at first erect, at length radiating. Fruit a subglobose loculicidal 4-5-valved capsule, dehiscing from the apex downward. #

1. M. uniflora (L.) Gray. Stems slender, creeping, about 10 cm. tall, the the leaves in tufts, 8-12 mm. in diameter, rotund-oval, on petioles 3-8 mm. long, acutely serrate, green and glabrous, dull, venose; peduncle 5-8 cm. long with a solitary bractlet; calyx greenish, the lobes ovate-oblong, 2.5 mm. long, obtuse; petals showy-white, starlike, the margins crinkled, ovate, narrowed at the base, very obtuse; stamens seemingly paired opposite each lobe, the filaments strongly curved, the anthers pendulous; ovary globose, green, the style longer than the ovary, with disc-shaped, 5-lobed stigma; capsule erect, 7 mm. in diameter.

Occasional in deep shaded woods, commonly on very mossy logs.

## 4. Chimaphila Pursh. Pipsissewa.

4 Evergreen herbs with spreading rhizomes and leathery persistent dark green leaves, alternate or apparently whorled. Flowers several in terminal corymbs. Sepals 5. Petals 5, white or pink. Stamens 10, the filaments dilated, the anthers tubular at the apex (apparent at the base due to the inversion). Ovary 5-chambered, the style short, erect, the stigma peltate, orbicular. Fruit a 5-valved loculicidal capsule opening from the apex downward.

O Leaves broadest below the middle, the veins whitish-mottled;
4 flowers 2-3 ........ 1. C. Menziesii

O Leaves broadest above the midule, same color throughout;
4 flowers 3-8 ........ 2. C. umbellata

1. C. Menziesii (R. Br.) Spreng. A pretty herb, the stems more or less prostrate; leaf midvein whitish towards the base, 3-6 cm. long, lanceolate, rounded near the base, acute, serrulate, the petioles 5-7 mm. long; flowers nodding, commonly 2 or 3 terminating the branch, the peduncle 3-4 cm. long, the bracts membranous, pedicels 5-8 mm. long; calyx-lobes ovate, 4 mm. long, increasing and strongly undulate in fruit; petals waxy, subrotund; ~~the~~ stamens and style subequal, the anthers longer than the filaments, which are dilated and hairy at the middle; capsule flattened-globose, 5-6 mm. in diameter.

Infrequent, and inconspicuous, occurring throughout our region in shaded woods ~~with~~ in packed duff; usually solitary. Orogrande Cr.; Fox Cr., 3000 ft.; Upper Priest L., 3000 ft.

2. C. umbellata (L.) Bart. var. occidentale (Rydb.) Blake. Princes Pine. Herb 10-30 cm. tall, the stems simple, ascending, glabrous; leaves in several whorls, 4-5 cm. long, 1-2.5 cm. wide, oblanceolate, glossy, obtuse, narrowed to a petiole 2-3 mm. long, sharply serrulate; flowers nodding, several, the peduncle 8-10 cm. long, glandular-puberulent, on pedicels 1.5-2 cm. long; calyx-lobes orbicular, rosy, 2 mm. long; petals orbicular, concave, tinged with rose, spreading at first then pressed backward, waxy, 6 mm. long; stamens spreading, rose-purple, 4 mm. long, the filaments abruptly dilated in the lower half, the margins ciliolate; pistil green, the capitate stigma sticky; fruiting capsules erect, with withering persistent bracts, subglobose, flattened equally at both ends, reddish-green, glandular-pubescent, the stigma prominent. (C. occidentalis Rydb.).

Common throughout our region in more or less shaded woods. The dried capsules often persist~~ing~~ to the following year. Type of var. occidentale is Sandberg et al. 519 from Pine Creek, near Farmington, Latah Co.

## 5. Pyrola (Tourn.) L. Wintergreen.

~~Perennial~~ herbs with slender stoloniferous rootstocks and persistent leathery leaves which are mainly basal. Flowers in racemes on slender erect bracteate scapes, nodding. Sepals and petals 5. Anthers often tubular at the apex (the apparent base, due to inversion). Stamens 10, the filaments declined. Ovary 5-chambered~~;~~, the style usually declined and curving, rarely erect, straight, the apex enlarged, forming a narrow collar near the tip below the more or less lobed stigma. ~~Fruit a 5-lobed~~, 5-valved ~~loculicidal~~ capsule, opening from the base upwards, the edges cobwebby.

0 Leaves all scale-like, the proper basal leaves wanting 4 or very small — 1. P. aphylla

0 Leaves scale-like or nearly wanting on the scape, ovate 4 or rotund at the base

2 Principal veins of leaves mottled with pale green — 2. P. picta

2 Leaves the same color throughout

4 Bracts prominent, reddish purple, 5-15 mm. 8 long, at least the lower ones longer than the pedicels; flowers purple

6 Stamens yellow; sepals 3.5-4 mm. long — 3. P. bracteata

6 Stamens purple; sepals 2-2.5 mm. long — 4. P. uliginosa

4 Bracts 3-5 mm. long or less, shorter than the 8 pedicels; flowers greenish or white except of P. minor which are sometimes pinkish

6 Leaves bright green, ovate, acute, thin, veiny — 5. P. secunda

6 Leaves dull green, oval or rotund, firm, not 10 markedly veiny

8 Style straight, erect, 2 mm. long — 6. P. minor

8 Style declined and curving, 5-10 mm. long

10 Leaves rotund or broadly ovate, 1-2.5 14 cm. in diameter, subentire — 7. P. chlorantha

10 Leaves oval, 2-4 cm. long, crenate — 8. P. elliptica

1. *P. aphylla* Smith. Leaves scale-like, the stems often reddish; flowers dull white tinged with pink, subtending bract 5-10 mm. long, racemes 5-10 cm. long on peduncles 15-20 cm. long; calyx-lobes 2-2.5 mm. long, triangular; petals obovate-cuneate, the upper two 7-8 mm. long, arching over the stamens, the lower 8-10 mm. long; stamens yellowish, anthers 4 mm. long, lightly mucronate at the tip, the filaments 6-7 mm. long; style deflexed, 7-8 mm. long; mature capsules flattened-globose, 6 mm. in diameter, the pedicels decurved, 8-10 mm. long.

Occasional in the dry duff of shaded woods. Rarely with a single ill ~~de~~formed leaf much suggesting those of *P. picta*.

2. *P. picta* Smith. Leaves 3-5 cm. long, very leathery, on petioles 2-5 cm. long, ovate or elliptical, obtuse, narrowed or rounded at the base, dark green and somewhat glossy, the principal veins whitish, the margin nearly entire; flowers greenish-white tinged with pink, racemes 5-10 cm. long on peduncles 15-20 cm. long, bearing a small bract near the middle, each subtended by a broadly ovate bract 3-4 mm. long; calyx lobes 2-2.5 mm. long, triangular, acute; petals nearly rotund or obovate, subequal, 6-7 mm. long; stamens yellowish, anthers 4 mm. long, the filaments 6 mm. long; style deflexed 8-9 mm. long.

Frequent in deep woods throughout our region at lower elevations.

3. P. bracteata Hook. Leaves thick and leathery, 4-8 cm. long, 3.5 cm. wide, oval or ovate, ~~less often~~ or broadly elliptical, mostly narrower above the middle than at the base, very obtuse or rounded at the apex, rounded at the base and shortly decurrent on petioles 2-5 cm. long, the upper surface dark and glossy, the lower paler, the veins prominent, ending at the margin in small callouses, thus ~~making~~ the margin shallowly sinuate; flowers rose-purple, ~~each~~ subtended by a reddish lanceolate bract .8-1.5 cm. long; ~~disposed in~~ racemes 10-15 cm. long, on peduncles 15-25 cm. long, bearing several reddish scales at the base and one near the middle; calyx lobes narrowly triangular-lanceolate, very acute, 3.5-4 mm. long; petals oval or obovate, 7-8 mm. long, the upper pair hooding the stamens, the lower somewhat larger; anthers 3-3.5 mm. long, yellow, mucronate at the base, the filament somewhat longer; style deflexed, 8 mm. long; mature pedicels slender, 6 mm. long. =/

Frequent throughout our region; the most common species.

4. P. uliginosa Torrey. Leaves nearly orbicular, rounded at both ends, 5-7 cm. in diameter, ~~thinner and less leathery than those of P. bracteata~~ on petioles 5-12 cm. long, ~~the margin~~ very shallowly crenate; flowers rose-purple, each subtended by a reddish bract 4-8 mm. long; ~~disposed in~~ racemes 10-15 cm. long, on peduncles 20-30 cm. long, bearing several reddish bracts at the base, and two or three above; calyx lobes triangular, acute, 2-2.5 mm. long; petals obovate, about 7 mm. long, the upper pair hooding the stamens, the lower somewhat larger; anthers 2.5-3 mm. long, purple, mucronate at the base, the filament 4 mm. long; style deflexed, 7-7.5 mm. long; mature pedicels slender, 5-7 mm. long. =/

Infrequent, occurring in boggy usually shaded, ground, which dries in late summer. Leaves thinner and less leathery than those of P. bracteata.

5. P. secunda L. Leaves bright green, membranous rather than leathery, the veinlets prominent, 2-4 cm. long, 12-25 mm. wide, ovate, acute or obtuse, rounded at the base, [redacted] finely serrate, petioles .5-1 cm. long; flowers greenish-white, each subtended by a lanceolate bract 3-4 mm. long; [redacted] one-sided, nodding, raceme [redacted] elongated and erect in fruit, 3-5 cm. long, on a peduncle 10-12 cm. long; calyx-lobes dark-green, 1 mm. long, rounded, the margin eroded; petals 3.5 mm. long, the stamens somewhat longer; anthers whitish; style 5-6 mm. long, nearly straight; capsules much flattened, 3.5-4 mm. in diameter, on slender pedicels 4 mm. long.

Common in more open places in moist woods, throughout our region at lower elevations.

6. P. minor L. Leaves oval or rotund, not leathery, mostly rounded at both ends, 1.5-2.5 cm. in diameter on petioles somewhat shorter, [redacted] serrulate, the veins terminating in small callouses; flowers white or pinkish, the sepals triangular, acute, 1.5 mm. long; petals orbicular, 4-5 mm. in diameter; ~~the~~ stamens 3 mm. long, the anthers yellow, 1.1 mm. long, not narrowed at the apex but opening there by a simple pore; style not declined, erect, without a collar, conspicuously 5-lobed; capsule depressed globose, 5-6 mm. in diameter.

Seen only at the Priest R. Exp. Sta., 4000 ft., Epling 6062.

7. P. chlorantha Sw. Leaves oval or rotund, dull green, 1-2.5 cm. in diamenter, nearly entire or obscurely callous-denticulate, the petioles 2-5 cm. long; flowers greenish-white, each subtended by a lanceolate bract 3-4 mm. long, racemes 3-6 cm. long, on often naked peduncles 15-25 cm. long, the lowermost flower often distant; calyx-lobes about 1 mm. long, rounded-ovate; petals oval, 6-7 mm. long; anthers nearly 3 mm. long, mucronate at the base, the filaments 4 mm. long; style deflexed, 6-7 mm. long; mature pedicels 6-8 mm. long, the capsules depressed-globose, 7 mm. in diameter.

Frequent at lower elevations in the duff of shaded woods; solitary.

8. P. elliptica Nutt. Leaves rather thin, dull green, broadly elliptical and obtuse at both ends or oval and rounded at both ends, even subrotund, 3-4 cm. long, 2-3 cm. wide, borne on petioles 1-3 cm. long, ~~the margins~~ very obscurely crenulate; flowers whitish, each subtended by a lanceolate bract 2.5-3 mm. long; ~~borne in~~ racemes 5-6 cm. long, the peduncles 15-20 cm. long, slender, bearing a bract near the middle; calyx lobes triangular, scarcely 2 mm. long; ~~the~~ petals veined, oval, 5-6 mm. long, subequal; anthers 2.5 mm. long, the filaments 3 mm. long; style deflexed, 6 mm. long; pedicels slender, 4-5 mm. long in flower; fruit not seen.

Seen only in rocks and swampy ground near head of Upper Priest Lake, Epling 7158.

## Primulaceae. Primrose Family.

Herbs with simple alternate or opposite or frequently basal leaves; stipules none. Flowers perfect, regular, symmetrical, 4-8, commonly 5-parted, solitary in the axils or in terminal umbels or racemes. Sepals united at the base. Petals united at the base, sometimes wanting. Stamens as many as calyx-lobes and alternate with them, opposite the corolla lobes, inserted on the short tube. Pistil 1, the ovary superior, 1-chambered, with a central placenta. Fruit a 1-chambered capsule, opening by 2-8 valves or circumscissile.

- 0 Leaves in basal tufts; corolla lobes soon reflexed — 1. **Dodecatheon**
- 0 Leaves in a whorl at the apex of the slender stem or distributed evenly along it; corolla lobes spreading 4
  - 2 Leaves in a whorl at the apex of the stem — 2. **Trientalis**
  - 2 Leaves distributed along the stem
    - 4 Leaves alternate — 3. **Centunculus**
    - 4 Leaves opposite
      - 6 Flowers red, plants prostrate — 4. **Anagallis**
      - 6 Flowers yellow, plants erect
        - 8 Flowers in dense ovoid or globose axillary spikes; corolla lobes linear 12 — 5. **Naumburgia**
        - 8 Flowers solitary in the upper axils on pedicels 3-4 cm. long; corolla lobes obovate or subrotund 12 — 6. **Steironema**

## 1. Dodecatheon L. Shooting Star.

Low perennial herbs with short rootstocks and sometimes bulbiferous and fleshy roots; leaves in a basal rosette. Flowers several in umbels at the apex of an erect scape which is longer than the leaves. Calyx 4-5-parted, united toward the base, reflexed in flower, erect in fruit. Corolla lobes 4 or 5, united below into a short tube, quickly and strongly reflexed in flower. Stamens usually 5, erect; the filaments free or united into a short tube, shorter than the anthers, the connective prominent, sometimes wrinkled, commonly colored. Capsule dehiscent by 5 vertical valves, also circumscissile at the tip in some species. Seeds numerous.

0 Anthers sessile or nearly so, the filament less than
4 1 mm. long

2 Leaf-blades rounded at the base, oval, coarsely
6 toothed — 1. D. dentatum

2 Leaf-blades attenuate below the middle, subentire — 2. D. integrifolium

0 Filaments united into a distinct tube about half the
4 length of the anthers — 3. D. Cusickii

1. D. dentatum Hook. Rootstocks slender, the leaves few, the earliest spatulate or obovate, entire, the blades of all thin, the mature ones ovate or oval, 4-12 cm. long, 3-6 cm. wide, obtuse or rounded at the apex, rounded or truncate at the base, abruptly narrowed to winged petioles 5-8 cm. long, the margin coarsely sinuate-dentate, both surfaces glabrous; scape 20-30 cm. tall, glabrous; flowers few on pedicels 2-6 cm. long; sepals triangular-ovate, 2-2.5 mm. long, acuminate; corolla white, the lobes oblong-lanceolate, 8-13 mm. long; anthers 5-7 mm. long, tapering upwards, acute, the filaments .5-1 mm. long, distinct, connective purple, smooth; capsule 6-10 mm. long, opening by valves from the apex.

In deep moist woods; rare. →

no H →Wiessner's Peak, Sandberg 602; St. Joe R., 2500 ft., Epling and Putnam 10313; ~~St. Joe, Christ 1573~~ → St. Joe, Christ 1573.

2. D. integrifolium Hook. Rootstocks 2-3 cm. long, matted, the leaves erect, 3-30 cm. long, 1-5 cm. wide, oblanceolate or the smaller obovate, obtuse or acute at the apex, narrowed gradually to the base, glabrous, the margin regularly callous-denticulate, rarely wholly entire; scapes 5-60 cm. tall, minutely glandular-puberulent, the bracts subulate, .5-1 cm. long, erect; flowers 2-12, rarely solitary, nodding, the mature pedicels 2-8 cm. long, slender, glandular; calyx-lobes lanceolate, acute, 4-5 mm. long, subequal to ~~[illegible]~~ the tube, increasing to 7 mm. in fruit; corolla rose-purple, its lobes 10-18 mm. long, oblong-lanceolate or lanceolate, acute, whitish at the base, yellow within the tube; filaments maroon or blue, rugose-reticulate, united with the corolla to form a tube 2-2.5 mm. long; anthers indigo-blue, narrowly lanceolate, 5-6 mm. long, acute, the style subequal; capsule 10-12 mm. long, 5 mm. wide, obtuse, ~~[illegible]~~ circumscissile near the apex and dehiscing vertically by 5-10 valves 2.5-3 mm. long; seeds 1.5 mm. long, flattened, narrowly winged.
n&H (D. conjugens Greene; a reduced and usually subalpine form.)

Frequent in boggy mossy places along cold streams.

3. D. Cusickii Greene. Rootstock slight, corm-like, sometimes bulbiferous, the roots numerous, slender; leaves 5-7, 3-12 cm. long, 1-3 cm. wide, variable, the blades mostly elliptical or ligulate, mostly obtuse, frequently subacute, rarely rounded, attenuate to a slender petiole often as long as the blade, the margin entire or obscurely callous-denticulate, rarely shallowly toothed; ~~[illegible]~~ scapes 10-30 cm. tall, slender, these and leaves glabrous or finely glandular-puberulent, the bracts 3-5 mm. long, erect, lanceolate; flowers 2-12, nodding, the mature pedicels 1-4 cm. long, usually more or less glandular-puberulent; sepals 3-4 mm. long, lanceolate or ovate-lanceolate, longer than the tube, usually puberulent; corolla purple, rarely white, the lobes 8-17 mm. long, 2-6 mm. broad, mostly oblong, obtuse, the tube yellow; filaments yellow, about half the length of the anthers; anthers 3-6 mm. long, oblong-lanceolate, purple, the connective smooth; capsules 7 mm. long, 5-valved from the apex. ~~[illegible]~~

Common in wet meadows and moist hillsides at low elevations in the grassland.

## 2. Trientalis L. Star Flower.

Low glabrous perennials with small tuberous rootstocks, the leaves few, in a whorl at the apex of the erect stem. Flowers 1-3 in an umbel from the whorled leaves. Calyx 5-7-parted. Corolla 5-7-parted, the lobes spreading. Filaments filiform, united at the base. Capsule opening by 5-6 vertical valves.

*1. T. latifolia* Hook. Leaves 5-6 in a whorl, 3-5 cm. long, unequal, broadly elliptical, shortly acuminate at both ends, glabrous, venose, thin; filiform pedicels, 2-5 cm. long; calyx-lobes linear-lanceolate, about half the length of the petals; petals white or pink, broadly ovate, about 1 cm. long, acuminate; capsule not seen.

Weissners Peak, *Sandberg 612*; Post Falls, *Christ 1079*.

## 3. Centunculus (Dill.) L. Chaffweed.

Small erect annuals with alternate entire leaves. Flowers minute, sessile in the axils. Calyx 4 (or 5)-parted. Corolla 4 (or 5)-parted, the tube about half the length of the lobes. Stamens 4 or 5, inserted on the bases of the lobes. Capsule globose, circumscissile; seeds numerous.

*1. C. minimus* L. Alternate obovate or subrotund, leaves 3-6 mm. long, glabrous; calyx-lobes subulate, acute, 2.5 mm. long; corolla pink, the lobes narrowly ovate, acute, 1.2 mm. long; capsule 2-2.5 mm. in diameter.

To be expected in low muddy places. Rathdrum, *Sandberg 894*.

## 4. Anagallis L. Pimpernel.

Low prostrate annuals with opposite leaves. Flowers axillary on slender pedicels. Calyx 5-parted. Corolla 5-parted, the lobes subrotund, spreading, convolute in the bud. Stamens 5, the filaments hairy. Capsule globose, circumscissile; seeds many.

1. A. arvensis L. Stems 15-30 cm. long; leaves broadly ovate, sessile, acute, glabrous, 8-12 mm. long; pedicels 15-20 mm. long, recurved in fruit; sepals ovate-lanceolate, 4 mm. long, acuminate; corolla from scarlet to pink, or blue with a darker spot at the base of each petal, the petals nearly distinct, 4-5 mm. long; capsule 5 mm. broad.

A weed of fields and open ground; naturalized from Europe.

### 5. Naumburgia Moench.

Erect perennial herbs with opposite leaves. Flowers in dense globose or ovoid pedunculate spikes borne in the axils of the leaves. Sepals 5-7, linear, imbricate. Corolla yellow, 5-7-parted, the lobes linear-spatulate. Stamens 5-7, alternating with an equivalent number of toothlike staminodia. Style filiform slender. Capsule opening vertically, few-seeded.

1. N. thyrsiflora (L.) Duby. An erect unbranched perennial ~~with rootstocks~~ 30-80 cm. tall, the stems glabrate; leaves sessile, the blades linear-lanceolate, lanceolate or elliptical, acute or gently acuminate, narrowed toward the base, punctate, the lower surface thinly villous, the margins subentire; spikes -9 mm. long, borne on peduncles 1-2 cm. long; bracts lanceolate; sepals lanceolate, 2.5-3 mm. long, punctate; petals linear-spatulate, pale yellow, spotted; capsules ovoid, 2 mm. long, spotted with red. (Lysimachia thyrsiflora L.).

Occasional in muddy or swampy places at low elevations. Priest Lake; near Kellogg; Granite Sta.

## 6. Steironema Raf.

Erect perennial herbs with opposite leaves and ciliate petioles. Flowers solitary in the upper axils. Sepals 5. Corolla yellow, 5-parted, the lobes obovate or subrotund, spreading. Stamens 5, alternating with 5 short toothlike staminodia. Style filiform. Capsule opening vertically, 10-20 seeded.

1. S. ciliatum (L.) Raf. Perennial with slender rather deeply seated rootstocks; stems erect, unbranched, 20-80 cm. tall, glabrate; leaves somewhat whorled in the uppermost axils, the blades ovate to ovate-lanceolate, 4-10 cm. long, mostly acuminate, rounded at the base, the margins entire, ciliolate, the petioles 8-15 mm. long, their margins strongly ciliate; flowers on nodding pedicels 3-4 cm. long, increasing somewhat in fruit; sepals oblong-lanceolate, acute, 5-6 mm. long, spreading; corolla lobes obovate-rotund, 5-7 mm. long, narrowed at the base to a short reddish claw; anthers and filaments subequal, spreading in anthesis, then erect, shorter than the petals, the staminodia subulate, reddish, 1.5 mm. long; capsules subglobose, 4 mm. broad, the style persistent. (Lysimachia ciliata L.).

In rocky crevices or gravelly places along streams and lakes at lower elevations.

## Plantaginaceae. Plantain Family.

¶ Herbs with basal or alternate leaves. Flowers perfect or polygamo dioecious, in spikes. Sepals 4, persistent. Corolla scarious, persistent, with 4 spreading lobes. Stamens 2 or 4, seated on the corolla. Ovary superior, 1-4-chambered. Fruit a circumscissile capsule (pyxis). =/

### Plantago (Tourn.) L.

Annual or perennial acaulescent herbs with basal, longitudinally ribbed leaves. Stamens sometimes conspicuously exserted during anthesis. Sepals 4, scarious margined. Capsule circumscissile, the seeds 1-several in each chamber, attached to the partition which falls away with the lid.

o Leaves linear, 2-6 mm. wide; annuals 1. P. Purshii
o Leaves lanceolate to ovate, 2-6 cm. wide; perennials
  2 Spike cylindrical, 5-20 cm. long; leaves ovate 2. P. major
  2 Spike ovoid-cylindrical, 2-3 cm. long;
    leaves lanceolate 3. P. lanceolata

**1. P. Purshii** R. & S. Annual, 5-30 cm. tall, hoary throughout with soft hairs; leaves 5-10 cm. long, 2-6 mm. wide, linear-oblanceolate, acute, narrowed toward the base, spikes dense, 2-8 cm. long, softly hairy, 4 mm. wide, on scapes 15-20 cm. long, bracts subulate, 3-4 mm. long, stiffish, ascending; sepals ovoid, 2.5 mm. long, with conspicuous scarious margins; corolla-lobes somewhat shorter, ovate, stamens barely exserted; pyxis obovate, blunt, dehiscent in the upper third, 2-seeded.

In dry gravelly soil in open places at low elevations; hardly proper to our region. Moscow; Orofino Canyon; Hayden Lake.

2. P. major L. Common Plantain. Perennial with leaves in a basal rosette, the blades 10-15 cm. long, ovate, abruptly petiolate, both surfaces softly pubescent or glabrous; spike 10-20 cm. long, 5-6 mm. wide, on a peduncle equally long; bracts broadly ovate, scarious margined, 2 mm. long, keeled; sepals similar, mostly obovate, 1.5-2 mm. long; corolla lobes 1 mm. long; pyxis ovoid to subglobose, 3 mm. long, dehiscent near the middle.

Common introduced weed of dooryards and waste places. Benton Cr., Epling 7890.

var. asiatica (L.) Dcne. Pyxis ovoid, dehiscent medianly about the lower half, well within the calyx.—Thatuna Hills, Epling and Houck 9115; Upper Priest R., Epling 7349; Sandpoint, Epling 10344; Cocollala, Epling; ridges north from Carbon, 2000 ft., Leiberg 1517.

3. P. lanceolata L. English Plantain. Perennial with a stout tap root, the leaves clustered, ascending or erect, 5-20 cm. long, sparingly pubescent, lanceolate or lanceolate-oblong; spike compact, at first ovoid, 1-2 cm. long, at length cylindrical, 2-3 cm. long; pyxis oblong, 2-seeded, the seeds concave on the inner side.

Common weed of lawns and meadows, introduced from Europe.

## Gentianaceae. Gentian Family.

Annual or perennial glabrous herbs with opposite simple entire leaves. Flowers perfect, regular, in racemes or cymose panicles. Calyx persistent, 4-5-lobed. Corolla 4-5-lobed, usually persistent after anthesis, its lobes convolute in the bud. Stamens as many as the corolla lobes, adherent to the tube. Ovary superior, 1-chambered, with 2 parietal placentae. Fruit a septicidal capsule. Seeds often winged or with a loose wrinkled envelope.

- Corolla rotate, the lobes each with 1 or 2 conspicuous glands which are surrounded by a fringe → 1. Swertia
  - ~~Corolla 5-parted, greenish white, each lobe bearing two glands, flowers few, in axils of upper leaves~~ ~~Swertia~~
  - ~~Corolla 4-parted, blue or lavender-blue, each lobe bearing a single gland; flowers numerous, in usually dense panicles~~ ~~2. Frasera~~
- Corolla funnelform, without glands, the lobes separated by membranous folds which are prolonged into lacerate appendages in the sinuses 2 Gentiana

## 1. Swertia L.

Ours simple erect herbs with flowers in axils of opposite upper leaves or bracts or in paniculate cymes. Sepals 4-5. Corolla rotate, 4-5-parted, each lobe bearing 2 fringed glands. Stamens 4-5, ~~inserted on the base of the corolla.~~ Capsule flattened, surrounded by the persistent corolla.

Corolla 5-parted, greenish white 1. **S. perennis**

Corolla 4-parted, blue (rarely white)

Cauline leaves in pairs; plants 20-40 cm. tall 2. **F. albicaulis**

Cauline leaves in whorls of 3; plants 50-200 cm. tall 3. **F. fastigiata**

**1. S. perennis** L. ~~var. obtusa Griseb.~~ Felwort. Erect glabrous herbs with solitary stems 30-40 cm. tall, arising from short slender rootstocks; basal leaves 10-15 cm. long, the blades obovate or broadly oblanceolate, tapering to a petiole as long or longer; cauline leaves 2-3 pairs, similar, smaller; flowers at most in a narrow panicle 10-15 cm. long, its branches few, each bearing 2-3 erect flowers; sepals narrowly lanceolate, very acute, 5-6 mm. long; corolla greenish-white, suffused with purple, its five segments 7 mm. long, increasing to 10 mm. in fruit, oblong, rather obtuse, each bearing 2 oval blue glands at its base, these surrounded by a fringe 1 mm. long; anthers green, one usually imperfect; capsule 12-15 mm. long, elliptical, subacute; seeds strongly flattened, 2 mm. broad, reniform to triangular, rugose, surrounded by a finely reticulate wing .3-.4 mm. wide.

To be expected in mountain meadows in the southern part of our range. Lolo Trail near Packers Meadows, Kirkwood 2047.

2. ~~F.~~ S. albicaulis ~~Dougl.~~ (Griseb.) Kuntze. Stems several, erect, 20-30 cm. tall, from a stout perennial taproot, minutely puberulent; basal leaves numerous, linear-oblanceolate, 8-15 cm. long, 5-10 mm. wide, 3-veined, the margins whitish; cauline leaves about 3 pairs, opposite, ascending, similar but smaller, all minutely puberulent with spreading hairs, canescent; terminal spicate panicles 2-6 cm. long, elongating in fruit, the bracts linear, 5-15 mm. long; sepals very acute, thin, 5-6 mm. long, spreading; corolla blue (rarely white), its lobes ovate-lanceolate, acuminate, 8-10 mm. long, each bearing an oblong, greenish gland down the middle, 3 mm. long, .5 mm. wide, fringed on the margins; stamens subequal to the corolla, ascending, alternating with lacerate scales 1/3 the length of the filaments; capsule 6-12 mm. long, elliptic. (Leucocraspedum albicaule Rydb.).

Dry open hillsides in the grassland.

3. ~~F.~~ S. fastigiata (Pursh) ~~Heller.~~ American Columbo. Stems .5-2 m. tall, from a stout taproot 2-3 cm. in diameter, glabrous throughout; basal leaves oblanceolate to obovate or elliptical, the blades 10-35 cm. long, tapering into a ~~mrgined~~ margined petiole 3-10 cm. long; cauline leaves similar but more oblong, in whorls of 3, reduced gradually upwards, all light and green; dense spicate panicle 10-15 cm. long, increasing to 30-40 cm. in fruit, bracts linear 1-2.5 cm. long; sepals 4, 3-6 mm. long in flower, increasing to 10 mm. in fruit, thin; corolla lavender~~-blue~~, veined with blue, the petals 9-12 mm. long, ovate-elliptical, persistent, each bearing a circular greenish gland at the base which is surrounded by a fringed margin 1.5-2 mm. tall; stamens erect, 5 mm. long; capsule broadly oval, 15 mm. long, finely mottled with darker green before drying; seeds flattened, subreniform, 5-6 mm. wide, rugose. (F. thyrsiflora Hook.).

Frequent on open gravelly hillsides at low elevations. This species ~~of our region and adjacent Washington~~ was ~~taken~~ first collected by Meriwether Lewis on ~~the Squamash Flats or at~~ near Weippe, ~~Idaho.~~

## 2. Gentiana (Tourn.) L. Gentian.

Herbs with ~~opposite entire leaves and~~ showy blue flowers borne in racemes or narrow panicles. Sepals 4 or 5. Corolla campanulate or funnelform, the lobes 4 or 5, without glands, frequently with plaited folds and appendages in the sinuses. Stamens inserted at the base of the corolla, included. Capsule enclosed within the persistent corolla, not flattened. Seeds often with loose reticulate envelopes or wings.

0 Slender annuals; corolla 9-12 mm. long — 1. G. amarella

0 Perennials with several stems from a rootstock;
4 corolla 2-4.5 cm. long

2 Flowers 1-3, the corolla ~~1-1.5 cm.~~ 10-15 mm. wide in the
6 throat, the lobes dotted with green; leaves very obtuse — 2. G. calycosa

2 Flowers 5-20, the corolla 4-10 mm. wide in the
6 throat; upper leaves mostly acute

4 Leaves ovate, 1-2 cm. wide; flowers in a
8 strict raceme — 3. G. oregana

4 Leaves oblong, 4-8 mm. wide; flowers in a
8 loose panicle — 4. G. affinis

1. G. amarella L. var. acuta Herder. An erect glabrous annual 5-30 cm. tall, the stems usually strict, unbranched, or in vigorous plants, branching at the base; basal leaves spatulate, 8-10 cm. long, the cauline mostly narrowly ovate, acute, sessile, 1.5-3 cm. long; flowers 3-7 in the upper axils, the pedicels 1-2 cm. long; sepals 4 or 5, unequal, 5-10 mm. long, 1-3 mm. wide, mostly oblong, obtuse; corolla 9-12 mm. long, bluish, ~~enlarging in age and closely surrounding the capsule~~ becoming greenish, the lobes 4 or 5, lanceolate-ovate, 3.5-4 mm. long, each bearing several filiform appendages at its base which form a fringed crown in the throat of the corolla; stamens as many as the lobes; ~~adnate in the lower part, included within the tube~~, stigmas 2, recurved, sessile; capsule narrowly conical, 12 mm. long; seeds ovoid, smooth, .7 mm. long, whitish.

Moist soil in shaded but open woods at low elevations; inconspicuous.

Moscow Mt.; Thatuna Hills; Hughes Fork Trail; West Kootenai; Cedar Mts.

2. G. calycosa Griseb. Stems several, ascending from horizontal rootstocks 3-6 mm. in diameter, 20-40 cm. tall; leaves ovate or rotund-ovate, rounded at the base and sessile, connate and clasping the stem, very obtuse, 3-5 veined, dull green, ascending, the floral sheathing the calyces; flowers 1-3, axillary on pedicels 1-3 mm. long, each subtended by a pair of ovate bracts subequal to the calyx or longer; calyx 10-25 mm. long, the tube membranous, 8-15 mm. long, the lobes 2-15 mm. long, unequal, spatulate to ovate, one sinus usually much deeper than the others; corolla deep blue, the tube often greenish, 3-4.5 cm. long, tubular-campanulate, 1-1.5 cm. broad in the throat, the lobes broadly ovate or rotund, spreading, obtuse 7-10 mm. long, dotted with green, separated by membranous folds which are prolonged into a bifid more or less lacerate appendage; stamens 2-3 cm. long, adnate below the middle, the anthers 2 mm. long, yellow; capsule 4 cm. long; seeds not seen. (Dasystephana calycosa Rydb.).

Occasional in meadows at higher elevations; abundant locally. Stevens Peak, 6425 ft.; Hoodoo Lake; Windy ridge trail, 6000 ft.; Wiessners Peak, 6400 ft.; Vanderbilt Gulch, 3000 ft.

3. , G. oregana Engelm. Stems numerous, 30-50 cm. tall; leaves ovate or the upper sometimes ovate-lanceolate, 1.5-4 cm. long, .7-2 cm. wide, mostly obtuse, the upper tending to be acute, all rounded at the base and sessile, connate and clasping the stem for 1-3 mm., 3-5-veined, pale and glaucous, ascending, the floral leaves sheathing at least the calyces; flowers 7-15 in a strict raceme, axillary on pedicels .5-1.5 cm. long, each subtended at the base of the calyx by a pair of oblong bracts somewhat longer than the calyces; calyx 10-12 mm. long, the tube 5-6 mm. long, membranous, the green lobes 3-8 mm. long, oblong or oblanceolate, unequal, separated by sinuses 1.5-2 mm. broad; corolla a rich blue, 2-3.5 cm. long, funnelform, 8-10 mm. wide in the throat, the lobes 4-6 mm. long, broadly ovate, spreading, acute or acuminate, separated by membranous lacerate folds; stamens 1.5-2 cm. long, the anthers 2 mm. long; capsule 2.5-3 cm. long; seeds 2 mm. long, winged, the margin as broad as the body of the seed. (Dasystephana oregana Rydb.).

Frequent in meadows at lower elevations. ~~Described from plants collected most likely near mouth of Clearwater R. by Rev. Henry Spalding.~~

4. G. affinis Griseb. Stems several, 30-40 cm. tall, slender, glaucous; leaves narrowly oblong, 2-3.5 cm. long, 4-8 mm. wide, mostly obtuse or the upper acute, sessile, clasping the stems, glaucous; flowers 5-20 in a loose slender panicle 8-15 cm. long, the peduncles 1-3 cm. long, each bearing 1-3 flowers, the bracts linear, spreading, 1-2.5 cm. long; calyx about 10 mm. long, the lobes narrowly oblong-elliptical, 2-5 mm. long, frequently nearly suppressed, the tube truncate, membranous; corolla blue, 2.5-3 cm. long, tubular-funnelform, 4-5 mm. wide in the throat, the lobes ovate, 4 mm. long, obtuse, separated by membranous folds which are prolonged into a 2-cleft appendage; stamens 2 cm. long, the anthers 2 mm. long; seeds winged all around. (Dasystephana affinis Rydb.).

Moist meadows along Mooyie R., Lyall.

## Menyanthaceae. Buckbean Family.

Perennial aquatic or bog plants with elongated creeping rootstocks. Leaves alternate, basal. Flowers perfect, born on an erect scape, solitary or racemose. Calyx 5-lobed, persistent. Corolla 5-lobed, valvate in the bud. Stamens 5, seated on the corolla. Ovary 1-chambered with 2 parietal placentae. Fruit a dehiscent or indehiscent capsule.

### Menyanthes (Tourn.) L.

Characters of the family with flowers racemose, the corolla lobes white-bearded within. Capsule indehiscent or tardily dehiscent. Seeds subglobose, shining.

1. M. trifoliata L. Buckbean. Rootstocks stout, fleshy, 20-30 cm. long or more, rooting in shallow water; leaves usually 3, the petioles expanded and sheathing in the lower half, 25-30 cm. long, the blades trifoliolate, the leaflets 8-12 cm. long, 3.5-7 cm. broad, ovate or broadly elliptical, obtuse, rounded or somewhat acuminate at the base, subsessile, entire, glabrous; scapes 10-50 cm. tall; flowers subtended by subfoliar bracts 3-12 mm. long, on ascending pedicels somewhat longer; sepals ovate, 3-4 mm. long; petals white or tinged with rose, copiously bearded within; capsule not seen.

In bogs at lower elevations. Hughes Meadow, 3000 ft.; Pend Oreille R.; Lake Pend Oreille; Granite Sta. →

→ Lindsey (1938) finds anatomical evidence for recognition of this family.

## Apocynaceae. Dogbane Family.

Erect perennial herbs (shrubs or trees) with milky juice. Leaves opposite (in our species) simple, stipules wanting. Flowers perfect, regular. Sepals 5, persistent. Corolla 5-parted, the lobes convolute in the bud. Stamens 5, distinct, attached at the base of the corolla. Pistil superior, of 2 distinct carpels united by their styles or stigmas. Fruit formed of 2 follicles.

## Apocynum (Tourn.) L. Dogbane.

~~Perennial herbs with milky juice and opposite, entire leaves~~ Flowers in terminal few-flowered panicles. ~~Sepals 5.~~ Corolla campanulate, the lobes either spreading or recurved in anthesis, then erect and connivent. Stamens included, the anthers sagittate. Follicles slender, erect or reflexed. Seeds small, with a copious silky tuft at the apex.

o Flowers white or whitish, the lobes of the corolla
4 spreading, not recurved in full flower

2 Leaves oblong-elliptical, mostly obtuse; sepals
6 subulate, scarcely .5 mm. wide ..... 1. A. cannabinum

2 Leaves ovate-lanceolate, mostly acute; sepals
6 lanceolate, .6 mm. wide or more ..... 2. A. floribundum

o Flowers rose-pink, veined with deeper pink, the lobes
4 recurved in full flower

2 Leaves 4-8 cm. long, sparingly villous beneath;
6 stamens 2.5-3 mm. long ..... 3. A. androsaemifolium

2 Leaves 1.5-5 cm. long, mostly glabrous beneath;
6 stamens 3.5-4 mm. long ..... 4. A. pumilum

1. A. cannabinum L. var. glaberrimum A. DC. Indian Hemp. Stems 50-100 cm. tall or more, branching above, the branches either erect or strictly ascending; leaves 4-8 cm. long, 8-12 mm. broad, ascending or nearly erect, oblong-elliptical, mostly obtuse at both ends, both surfaces green and glabrous, the lower glaucous, borne on petioles 1-2 mm. long; ~~flowers numerous in subterminal~~ many-flowered panicles, the bracts subulate, scarious, 2-3 mm. long; sepals subulate, 1.5-2 mm. long, acute; corolla greenish-white, 3 mm. long, the lobes subequal to the tube, erect and soon connivent, obtuse, f~~i~~llicles 8-10 cm. long, glaucous; seeds 4 mm. long, the tuft 2 cm. long.
o

Occasional along lake shores at low elevations.

no 4 → Clark~~s~~ Fork Valley, ~~680 m.~~ 2200 ft., Leiberg 1557; Priest Lake, Epling 7771.

2. A. floribundum Greene. Stems numerous from a woody crown, 50-60 cm. tall, branching above, very leafy; leaves 3-6 cm. long, 1.5-4 cm. broad, narrowly ovate to oblong-lanceolate, the upper at least, narrowed toward the base, the lower rounded, all mostly acute at the apex, ascending, the upper surface dull, the lower glaucous but not markedly paler, borne on petioles 2-3 mm. long; flowers in short terminal panicles 3-4 cm. long, scarcely exceeding the foliage, the bracts subulate, 1-2 mm. long; sepals greenish, 1.5- =/ 2.5 mm. long, lanceolate, acute, submembranous; corolla white or tinged with pink, the reddish veins wanting, the tube 3 mm. long, the lobes 1.5-2 mm. long, obtuse ~~spreading in anthesis~~; stamens 2.5 mm. long; follicles not seen.

At low elevations usually in sandy soil along streams or lakes.

tr. 3. A. androsaemifolium L. var. incanum A. DC. Mountain Hemp Stems usually solitary, 40-60 cm. tall, branching mostly in the upper half, the branches ascending, leaves 4-8 cm. long, 2-5 cm. broad, ovate, rounded at the base, obtuse at the apex, spreading or drooping, hardly ascending, dark green and glabrous above, pale below and sparingly villous, the veinlets prominent, ~~borne on petioles 2-4 mm. long~~; ~~flowers in terminal~~ few-flowered panicles; sepals ovate to lanceolate, acute, 1.5-2 mm. long, the margins thin; corolla rose-colored, with veins of deeper pink, the tube 4-5 mm. long, the lobes 2.5-3 mm. long, mostly obtuse, 3-veined~~, recurved in anthesis~~; stamens 2.5-3 mm. long; follicles 8-12 cm. long, reflexed, glaucous, seeds 2 mm. long, the tuft 10-14 mm. long.

Frequent in open places at lower elevations.

4. A. pumilum (~~A.~~ Gray) Greene. Mountain Hemp. Stems usually solitary, 20-40 cm. tall, branching throughout, the branches ascending; leaves 1.5-5 cm. long, 1-4 cm. broad, generally ovate, varying to elliptical or subrotund, more commonly rounded at the apex or sometimes obtuse, spreading or drooping, dark green and glabrous above, the lower surface pale, mostly glabrous, ~~sometimes thinly villous on the veins~~, the veinlets prominent, ~~borne on petioles 2-4 mm. long~~; ~~flowers in~~ few-flowered ~~terminal~~ panicles; sepals mostly ovate-lanceolate, acute, 1.5-2 mm. long, the margins thin; corolla rose-pink, with veins of deeper pink, the tube 3-5 mm. long, the lobes 2-3 mm. long, mostly acute, but frequently obtuse, ~~recurved during anthesis~~, 3-veined; stamens 3.5-4 mm. long; follicles 8-14 cm. long, glaucous, erect; seeds 2 mm. long, the tuft 10-14 mm. long.

Common in dry open ground or in dry open woods and in burns from 2500 6000 feet or more. =/

## Asclepiadaceae. Milk-weed Family.

Perennial herbs (or shrubs) with milky juice. Leaves opposite or whorled (in our species); stipules wanting. Flowers perfect, regular, usually in umbels. Sepals 5. Corolla 5-parted, the lobes valvate in bud. Stamens 5, inserted on the base of the corolla, the filaments united into a tube which encloses the pistil, the tube bearing a circlet of 5 hooded appendages each with an incurved prong, the anthers joined to the pistil, their sacs tipped with a membranous appendage, each containing a waxy coherent mass of pollen (pollinium), the contiguous pollinia of adjacent anthers being suspended in pairs from the glands of the stigma. Pistil of 2 distinct superior ovaries, forming 2 follicles in fruit. Seeds tipped with a tuft of silky hairs.

### Asclepias. (Tourn.) L.

Perennial herbs as described above.

○ Plants softly tomentose; leaves
4 6-9 cm. wide — 1. A. speciosa
○ Plants very glabrous; leaves 8-15 mm. wide — 2. A. mexicana

1. A. speciosa Torrey. Showy Milkweed. Erect coarse hoary herbs 60-150 m. tall; leaves ovate or oval, obtuse, rounded at the base, entire, upper surface glabrate in age, the lower softly tomentose, borne on petioles 3-6 mm. long; flowers in woolly axillary umbels, on peduncles 3-5 cm. long, the bracts linear, 4-6 mm. long, the rays 2-2.5 cm. long; sepals 5 mm. long, lanceolate, lightly acuminate, woolly; petals purple, elliptical-ovate, 8-10 mm. long, woolly on the outer surface, strongly reflexed; hoods yellowish, spreading, 12-15 mm. long; stamen column 4-5 mm. tall, the appendages white-scarious; follicles 10 cm. long, 2.5 cm. broad, abruptly tapering, softly arachnoid tomentose and with soft herbaceous spine-like processes; seeds flattened-oval, margined, 7 mm. long, the tuft 3-3.5 cm. long.

Occasional in fields and open places in the grassland. Hardly proper to our region.

Lake Coeur d'Alene, ~~640 m~~ 2100 ft., Leiberg 1311; Lake Pend Oreille, Sandberg 520, 815.

2. A. mexicana Cav. Narrow-leaved Milkweed. Glabrous perennial herbs 50-60 cm. tall with usually several slender stems ascending from a stout horizontal woody rootstock; leaves linear or linear-lanceolate, 6-12 cm. long, 5-15 mm. wide, tapering at the base to slender petioles 3-8 mm. long, entire, pale dull green; flowers in terminal compound hirtellous umbels, the primary rays 1.5-3 cm. long, 3-4 cm. in fruit; pedicels slender, 8-10 mm. long; sepals 1.5 mm. long, lanceolate; petals lavender, ovate, 3 mm. long, soon reflexed, later becoming erect; hoods and prongs white, erect, the prongs curving over the stamen column; pods 8-10 cm. long, less than 1 cm. thick, sparingly pubescent at least when young; seeds 6-8 mm. long.

Infrequent in dry, gravelly soil at low elevations; poisonous to stock but too infrequent to be a factor in our region. Remarkable for its wide range, extending south into Mexico.

no ¶ Near Post Falls, Epling; Clark Fork Valley, ~~650 m.~~ 2150 ft., Leiberg 1667; Coeur d'Alene, Christ 1194.

## Polemoniaceae. Phlox Family.

Herbs with alternate or opposite simple or pinnate leaves without stipules. Flowers regular or nearly so, 5-merous, perfect. Corolla from saucer-shaped to tubular, the lobes convolute in the bud. Stamens alternate with the corolla-lobes, the filaments adnate to the tube, but often unequal and inserted at different levels. Ovary superior, 3-chambered, the style 1, 3-lobed. Fruit a 3-valved, 3-chambered loculicidal capsule. Seeds often with a mucilaginous coat when wetted.

=1

0 Leaves all opposite or appearing whorled
2 Leaves entire 1. Phlox
2 Leaves palmately divided into 3-5 filiform
6 segments, thus appearing whorled
4 Corollas 3-6 mm. long; filiform-stemmed annuals 2. Linanthus
4 Corollas 13-15 mm. long; stiff-stemmed perennials 3. Linanthastrum
0 Leaves, at the least the upper, alternate
2 Leaves entire
4 Leaves all alternate; flowers in globose clusters 4. Collomia
4 Lower leaves opposite; flowers solitary in axils 5. Microsteris
2 Leaves pinnate or pinnatifid
4 Corolla trumpet-shaped, the tube twice as long
6 as the lobes or longer
Calyx-lobes very unequal, spinose, sometimes
10 cleft; leaves prickly 6. Navarretia
8 Calyx-lobes subequal, not spinose; leaves
10 not prickly
8 Stamens inserted on the tube at the same
12 level 7. Gilia

Stamens inserted on the tube at
12 different levels 4. Collomia

4 Corolla campanulate or subrotate, the lobes as
8 long as the tube or longer
6 Corolla subrotate, shorter than the calyces;
10 annuals 8 Polemoniella
6 Corolla campanulate or nearly so, twice as
10 long as the calyces; perennials. 9 9. Polemonium

## 1. Phlox L. Phlox.

Perennial herbs of varied habit, more or less woody at the base, with opposite, entire, linear or linear-lanceolate leaves. Flowers showy, often fragrant, solitary at the tips of branches or in terminal corymbose cymes. Calyx-tube 5-ribbed, scarious between the ribs, the lobes slender, erect or somewhat spreading. Corolla-tube slender, even, the lobes spreading, obovate or obcordate. Stamens 5, included, the filaments equally adnate to the corolla-tube. Capsule contained within the calyx which it ruptures at maturity.

0 Leaves 10-14 mm. long; plants prostrate 1. P. Douglasii
0 Leaves 2.5-8 cm. long; plants erect 2. P. speciosa

1. P. Douglasii Hook. A pretty prostrate cushion plant with short branching caudex from which arise slender branching stems 10-20 cm. long, pubescent with short spreading somewhat glandular hairs; leaves spreading or ascending, 10-14 mm. long, linear, pungent, spinulose at the tip, the margins glandular-ciliolate at least near the base; flowers solitary at the tips of the branchlets, sessile; calyx 6-8 mm. long, ~~rotate in fruit,~~ thinly villous, the lobes subequal to the tube, pungent, rotate in fruit; corolla white, lavender or blue, the tube 7-12 mm. long, even, the lobes 4-7 mm. long; stamens yellow, hardly exserted; capsule 3-4 mm. long, subglobose;

seeds lenticular, about 3 mm. long.

Dry rocky ground at all elevations; infrequent.

[illegible]. P. speciosa Pursh. Bushy much-branched herbs with leafy ascending stems 20-40 cm. long, woody at the base, pubescent with short spreading more or less glandulary hairs; leaves linear or linear-lanceolate, variable, 2.5-8 cm. long, 1-5 mm. wide, very acute, glabrate; flowers showy, in terminal corymbose cymes, borne on puberulent pedicels 1-5 cm. long; calyx 7-9 mm. long, scarious between the lobes, glandular-puberulent, the lobes somewhat shorter than the tube; corolla pink, its tube 12-15 mm. long, its lobes broadly obovate, notched, 8-12 mm. long; capsule 4-5 mm. long, ellipsoid.

Dry open slopes at low elevations, hardly proper to our region. Moscow; [illegible] Bay; Little Potlatch Canyon; Coeur d'Alene; Julietta; Spirit Lake.

## 2. Linanthus Benth.

Low slender annuals with filiform stems and opposite leaves palmately divided into filiform divisions, appearing whorled. Flowers in ours in terminal racemes or in cymose panicles. Calyx 5-lobed, the lobes equal, the tube scarious below the sinuses. Corolla subfunnelform, the tube equalling or shorter than the lobes. Stamens equally inserted on the corolla-tube. Seeds in ours solitary in each chamber.

O Corolla [illegible] mm. long 1. L. Harknessii

O Corolla [illegible]-3 mm. long 2. L. filipes

1. L. Harknessii (Curran) Greene. Stems filiform, 15-30 cm. tall, freely branched, puberulent, the internodes 2-3 times as long as the leaves; filiform lobes 1-1.[illegible] cm. long, sparingly hispidulous; flowers solitary on filiform pedicels 1-[illegible] cm. long; calyx 2-2.5 mm. long, sparingly hispidulous or glabrous, the lobes equal, triangular-subulate, very acute,

scarious-margined, .8-1.2 mm. long; corolla bluish, 3 mm. long, the tube and limb subequal; filaments glabrous, 2 mm. long; capsule oval, obtuse, 2.5 mm. long, shallowly 3-lobed; seeds less than 1 mm. long.

Frequent on dry gravelly slopes and basaltic ledges.

2. L. filipes (Benth.) Greene. Stems filiform, 15-30 cm. tall, freely subdichotomously branched, puberulent, internodes 2-3 times as long as the leaves; filiform lobes 1-1.5 cm. long, sparingly hispidulous; flowers solitary on filiform pedicels 1-2.5 cm. long; calyx 2.5 mm. long, the lobes triangular-subulate, .8-1 mm. long, scarious margined, sparingly hispidulous or glabrous; corolla white or tinged with rose, 5-6 mm. long, the limb twice the length of the tube, the segments oval or obovate, 2-2.5 mm. wide; filaments glabrous, 2.5-3 mm. long; capsule oval, slightly 3-lobed.

Grassy gravelly borders of pine woods, valley of Ishimakain, Geyer 535; dry prairies, Kootenai Co., Sandberg 7219.

## 3. Linanthastrum. Ewan

Tufted puberulent pernnials with rather stiffish, Phlox-like stems, the upper internodes mostly shorter than the leaves; leaves 5-7 parted, the segments acicular, entire, the midnerves obscure. Flowers borne in the upper axils, scarcely exserted from the tufted leaves but sometimes showy, sessile. Calyx campanulate, the tube short, not scarious-membranous below the sinuses of subulate teeth. Corolla-tube funnelform, the lobes 5, obovate, rounded, lighter colored. Stamens inserted just below the throat, the filaments glabrous. Pistil included, nearly equalling the tube. Seeds 2-3 in each chamber.

1. L. Nuttallii (Gray.) Ewan. Rather woody branching crown, the stems several, 15-20 cm. tall, puberulent, straw-colored, leaf segments 1-1.5 cm. long, less than 1 mm. broad, flat, glabrous but sparingly ciliolate; due to the relative shortness of the internodes especially in the upper parts, the leaves overlap, forming ~~chara-like~~ piny tufts near the tips of the stems, those in the lower half soon withering; calyx 8-10 mm. long, the tube 2 mm. long, the teeth lance-subulate, very acute, puberulous; corolla-tube yellow, 8-9 mm. long, glabrous within, pubescent with curling hairs without, the lobes 4-5 mm. long, white or pale blue; capsules narrowly obovate, 5 mm. long, smooth. (Gilia Nuttallii Gray)

Barren ridge south of Pole Mt., 5000 ft., Epling & Kempf. The herbage is distinctly hay-scented. This genus is most closely related to Linanthus but differs ~~importantly~~ from that very natural group of annuals in its habit-form, in the calyces not being scarious below the sinuses of the teeth, and its more northern montane distribution suggesting a different origin ~~from~~ than Linanthus. From Leptodactylon, on the other hand, it differs in having hardly pungent, closely opposite, falsely whorled leaves, the segments not at all aristiform. This species and a second from Southwestern United States, are best understood when admitted as a small genus of transitional morphology.

## 4. Collomia Nutt.

Erect annual herbs with alternate entire or pinnatifid leaves. Flowers in small capitate terminal clusters, subtended by foliaceous bracts. Calyx 5-cleft, scarious below the sinuses, usually increasing somewhat in fruit. Corolla trumpet shaped, the tube slender, the lobes spreading, sometimes slightly unequal. Stamens 5, seated on the corolla-tube at unequal intervals, included. Capsules 3-lobed, smooth and shining. Seeds few, becoming mucilaginous when wetted.

o Leaves ovate, pinnatifid 1. C. heterophylla

o Leaves lanceolate, entire

2 Corolla 2.5 cm. long 2. C. grandiflora

2 Corolla 10-15 mm. long 3. C. linearis

1. C. heterophylla Hook. Stems ~~An erect, much branched annual~~ 15-25 cm. tall, the branches ascending, glandular-pubescent; leaf-blades 1-2 cm. long, ovate, some sometimes entire, mostly pinnately incised, the lobes lanceolate, acute, spreading, cuneately attenuate to a petiole ~~nearly as long as the~~ accrescent, ~~blade~~, both surfaces glandular-pubescent; flowers in axillary and terminal clusters, sessile or on short peduncles, subtended by subfoliar ~~but mostly~~ entire bracts; calyx 4.5 mm. long, at anthesis, subscarious glandular, the lobes acute, ~~increasing to 8 mm. in fruit, the~~ top-shaped in fruit, the lobes lanceolate, equal to the tube; corolla rose-colored, 10-15 mm. long, its lobes 2-3 mm. long; capsule 4 mm. long, oval; seeds brown, dull, 1.5 mm. long, roughened.

Infrequent in dry ground at low elevations. →

no 4 → O'Gara, Epling and Offord 8157; Slackwater, ~~650 m.~~ 2100 ft., Leiberg 1291; Wiessner's Peak, Sandberg 585.

2. C. grandiflora Dougl. Stems simple to the inflorescence, 15-100 cm. tall or more, glabrate below, pubescent above; leaves narrowly lanceolate or oblanceolate or narrowly elliptical, 2-5 cm. long, 3-6 mm. wide, sessile, acute, glabrous, entire; globose heads, 1-1.5 cm. broad, borne at the tips of short lateral branches, subtended by ovate acuminate bracts 1-1.5 cm. long; calyx sessile, 6 mm. long, the tube membranous, the lobes 2.5 mm. long, acute or obtuse, glandular, lanceolate, accrescent, finally top-shaped; corolla 2.5 cm. long, corn yellow, the tube very slender, puberulent, tapering, the limb 8-9 mm. long, slightly irregular, the lobes 2.5 mm. wide; stamens blue; capsules obovate, 4.5 mm. long, 3-lobed, smooth; seeds brown, dull, 2.5-3 mm. long, the angles narrowly margined.

Frequent on dry gravelly slopes and in burns.

3. C. linearis Nutt. Stems simple or branching above, rarely from the base, 10-50 cm. tall, pubescent below, glandular above; leaves 1.5-5 cm. long, lanceolate or linear-lanceolate, acute, narrowed at the base, sessile, puberulent; cymose head-like clusters in the uppermost axils, borne on peduncles 5-20 mm. long, subtended by subfoliar bracts, very acute, glandular, 1-4 cm. long; calyx 5 mm. long, glandular, the tube membranous, top-shaped in fruit, the lobes 2 mm. long, lanceolate, acute; corolla 10-15 mm. long, tubular, tapering, the tube yellow, the lobes pink, spreading, ovate, 1.5-2 mm. long; capsule 3 mm. long, obovate, 3-lobed, smooth; seeds brown, dull, 2 mm. long, the angles slightly margined.

Frequent on dry gravelly slopes and in burns.

## 5. Microsteris Greene.

Low branching erect annuals with entire opposite basal and alternate cauline and floral leaves. Flowers axillary, arranged in terminal cymes. Calyx 5-lobed, scarious between the ribs, the tube ruptured by the capsule at maturity, the lobes equal. Corolla tubular, the limb rotate. Stamens inserted at unequal intervals upon the corolla tube. Seeds mucilaginous when wetted.

1. *M. gracilis* (Dougl.) Greene. Stems 10-20 cm. tall, glandular-villous, branching chiefly above; lowermost leaves oblong or obovate, obtuse, 1-2.5 cm. long, glabrate, the upper lanceolate, 1.5-3 cm. long, acute, sessile, glandular; pedicels 1-2 mm. long; calyx 5-8 mm. long, slender, the lobes subequal to the tube, subulate, spreading in fruit after bursting of the scarious tube, 7-8 mm. long; corolla-tube 7-9 mm. long, yellowish, the limb pink to nearly white, bearing a darker spot, its lobes 1-2.5 mm. long, rotate, notched; capsule subglobose, 3 mm. in diameter; seeds solitary in each chamber. (*Collomia gracilis* Dougl.; *C. humilis* Dougl.; *Gilia gracilis* Hook

Common in dry or gravelly soil at low elevations.

## 6. Navarretia R. & P.

Low rather rigid branching or unbranched annuals with alternate pinnate or pinnatifid leaves or the lowermost subentire, the segments rigid and more or less spinose. Flowers perfect in crowded terminal clusters subtended by foliaceous bracts. Calyx unequally 5-lobed, the lobes rigid, spinose, entire or cleft, in ours somewhat longer than the scarious tube. Corolla tubular, the lobes spreading.

| | |
|---|---|
| Bracts and calyces white-woolly | 1. N. intertexta |
| Bracts and calyces glabrous | 2. N. squarrosa |

**1. N. intertexta** (Benth.) Hook. Stems 3-15 cm. tall, branching below or simple, pubescent; leaves few, 1-2 cm. long, pinnately or bipinnately cleft into linear spinose segments, glabrous or nearly so, the segments unequal, 2-10 mm. long; subfoliar bracts white-woolly at the base; calyx sessile, 7 [illegible], some of the lobes cleft, ~~all~~ [illegible] spinose; corolla white, tinged with lavender, 6-7 mm. long, the lobes 1-1.5 mm. long; stamens shortly exserted. 11

Occasional in grassy places or along roadsides at low elevations.

**2. N. squarrosa** (Esch.) H. & A. Skunkweed. Stems 10-30 cm. tall, simple or much-branched, pubescent and glandular, ~~evil~~ skunk-smelling; leaves 1-3 cm. long, pinnately or bipinnately parted and cleft, the segments acute, spinose; calyx sessile, 11-12 mm. long, the tube scarious, the lobes subulate, spinose, mostly entire; corolla pale blue, 8-10 mm. long; stamens included.

To be expected as an occasional entrant along roadways at low elevations, doubtless as an introduction from ~~maritime stations of~~ the Pacific Coast.

## 7 Gilia R. & P.

Herbs with alternate pinnatifid leaves. Flowers in globose heads or clusters or loose cymes, these solitary or panicled. Calyx 5-lobed, the tube scarious between the ribs, at length ruptured by the capsule in fruit, the lobes subequal. Corolla more or less trumpet-shaped, the lobes acute, spreading. Stamens subequally inserted on the corolla tube, usually exserted. Seeds mucilaginous when wetted.

| | |
|---|---|
| o Corolla 8 mm. long, bluish; annuals | 1. G. capitata |
| o Corolla 3 cm. long, scarlet; perennials | 2. G. aggregata |

1. G. capitata Dougl. Stems erect, simple or branching above, 30-60 cm. tall, glabrous; leaves 3-8 cm. long, pinnate or bipinnate, the segments linear, acute, glabrous or puberulent; dense, terminal, subglobse heads 1.5- cm. broad; calyx 4 mm. long, glabrous, subsessile, the tube very scarious, about twice as long as the ovate-acuminate, scarious margined lobes; corolla blue or whitish, funnelform, 8 mm. long, the lobes nearly as long as the tube, linear-lanceolate, acute; filaments glabrous, 3 mm. long, inserted at the sinuses.

Kootenai Co., sandy soil, Sandberg 7141.

2. G. aggregata (Pursh) Spreng. Scarlet Gilia; Skyrocket. Stems usually several, 50-100 cm. tall, woolly-pubescent, simple or branching, glandular, ascending from a branching crown; leaves 2-5 cm. long, pinnatifid into 7-13 linear acute segments 1-1.5 cm. long, 1 mm. wide, spinulose at the tip, thinly pubescent; clusters or cyme aggregated into showy panicles 15-30 cm. long; pedicels 2 mm. long with a bractlet near the apex; calyx 8 mm. long, the lobes twice the length of the tube, subulate, acute, spinulsoe, the margins scarious below; corolla 3 cm. long, scarlet, trumpet-shaped, the tube 20-25 mm. long, puberulent, the lobes

recurved, lanceolate, oblong-acuminate, mottled, 6-8 mm. long; anthers yellow, filaments and style red; capsule 5-7 mm. long; seeds 2.5 mm. long.

Frequent in dry soil along roadways and on slopes at low elevations, or at higher elevations on dry ridges and in severe burns, mostly towards the southern part of our region. Type taken by Lewis on "Hungry Creek", ~~w. Idaho~~, now Lolo Cr.

## 8. Polemoniella Heller.

Lax annual herbs with inconspicuous white flowers, solitary and axillary. Leaves 9-13-foliolate, the lower leaflets usually stalked, rather remote. Corollas shorter than the calyces, subrotate. Capsule globose, 8-10 seeded.

1. P. micrantha (Benth.) Hel. Stems 15-30 cm. tall, branching either at the base or throughout, sparsely glandular; leaves 3-7 cm. long, leaflets all elliptical-ovate, obtuse at both ends, 6-8 mm. long, glandular; pedicels .3-1.5 cm. long; calyx-lobes ovate-elliptical, 5-7 mm. long, obtuse; corolla 4-5 mm. long; stamens 1.5 mm. long, inserted near the middle of the tube; capsule 5 mm. in diameter. (Polemonium micranthum Benth.).

Sandy soil near Moscow, Miller; Coeur d'Alene, Christ 738.

## 9. Polemonium L. Jacob's Ladder.

Erect perennial herbs with alternate pinnate leaves. Flowers showy, blue, in terminal sometimes panicled cymes. Calyx green, not scarious below the sinuses or if so, but little, accrescent, not distended by the capsule. Corolla subcampanulate. Filaments equally inserted on the corolla tube, hairy at the base. Capsules globose; seeds mostly 1 in each chamber.

0 Leaflets 2-12 mm. long; corolla blue purple-streaked 1. P. pulcherrimum
0 Leaflets 1-4 cm. long
  2 Stems 20-50 cm. tall, corolla whitish or
    6 pale blue; anthers white 2. P. columbianum
  2 Stems 60-100 cm. tall; corolla violet blue,
    6 whitish in the tube; anthers yellow 3. P. occidentale

1. P. pulcherrimum Hook. Pretty perennials 5-30 cm. tall with 1-several slender ascending stems, glandular-pubescent; basal leaves few to numerous, 3-15 cm. long, with 8-10 pairs of leaflets, cauline leaves similar; petioles .5-4 cm. long; leaflets mostly elliptical, but obtuse at both ends, rotund on small plants, 2-12 mm. long, all glandular-pubescent; cymes few-flowered, on pedicels 2-5 mm. long, accrescent; calyx glandular-pubescent, 3-4 mm. long, campanulate, the lobes subequal to the tube, oblong-lanceolate, obtuse; corolla blue, striate with purple, yellow in the tube, 8-10 mm. long, the lobes obovate, emarginate, subequal to the tube; stamens 6-7 mm. long; capsule 3 mm. long, subglobose; seeds deep mahogany brown, 1.6 mm. long, glossy.

In rock crevices and gravelly soil at high elevations. Snowy Top Mt., 6000-7400 ft.; St. Joe R.; Continental Mt., Christ 1680.

2. P. columbianum Rydb. ~~Somewhat~~ ~~mephitic~~ perennials with branching rootstocks and usually a single ascending or erect stem 20-50 cm. tall; basal leaves numerous, 10-30 cm. long, glandular-villous or # pilose, the petioles 2-5 cm. long; leaflets 21-23, cauline leaves similar, smaller; leaflets 1-4 cm. long, mostly elliptical and obtuse at both ends, all viscid-villous, rarely subglabrous; flowers rather showy, in viscid clustered cymes; pedicels 2-8 mm. long, somewhat accrescent; calyx 6 mm. long, glandular, the lobes lanceolate, somewhat longer than the tube, acute; corolla striate with purple to lavender, yellowish in the throat, the tube 3.5-5 mm. long, the lobes obovate or oval, 3-8 mm. long; stamens pilose within the tube, 4 mm. long, the anthers white; capsule 4-5 mm. long, globose; seeds 2 mm. long, dark mahogany brown, rugulose. (P. Helleri Brand).

Frequent in thin woods at higher elevations and along wooded ridges. This species and the next both have an unpleasant odor as of skunk.

3. P. occidentale Greene. ~~Mephitic~~ perennials with slender rootstocks and with usually few or no basal leaves; stems erect, 60-100 cm. tall, branching only in the inflorescence, glandular-villous; viscid, lower leaves 20-30 cm. long, with petioles 8-10 cm. long, bearing 8-11 pairs of leaflets, the upper leaves similar, smaller; leaflets ovate to broadly lanceolate, 2-4 cm. long, 6-20 mm. wide, mostly acute, rounded at the base, very shortly stalked or sessile, thinly glandular-villous; panicled cymes glandular; calyx 6-7 mm. long, accrescent, its lobes oblong, acute or obtuse, glandular, equalling the tube, scarious below the sinuses; corolla violet blue, the tube whitish, often veined with purple, 4-5 mm. long, the lobes rhombic-obovate, 6-10 mm. long; stamens half to two thirds the length of the corolla-lobes, the filaments hairy at the base closing the tube, the anthers bright yellow; capsule 3-4 mm. long, globose; seeds dark mahogany brown, 3 mm. long, glossy.

In moist meadows at lower elevations under or amongst shrubbery.

## Hydrophyllaceae. Phacelia Family.

Herbs with usually alternate and pinnate but sometimes simple and basal leaves; stipules wanting. Flowers perfect, regular, borne in scorpoid cymes, these sometimes capitate, less often solitary in the axils or on naked scapes. Sepals 5, sometimes with small appendages in the sinuses. Corolla deeply 5-lobed, mostly campanulate, often with appendages inside. Stamens 5, alternate with the corolla lobes, the filaments adnate to the corolla-tube. Ovary superior, 1- or 2-chambered, the placentae parietal; styles 2; more or less united. Fruit a capsule.

0 Small herbs with only basal leaves; flowers solitary
4 on scapes 1-4 cm. tall — 1. Hesperochiron

0 Herbs with alternate leaves; flowers mostly in
4 scorpoid cymes; in one species solitary in the axils

2 Low creeping herb with flowers solitary in the axils;
6 calyx with an appendage in each sinus — 2. Nemophila

2 Erect herbs; flowers numerous in scorpoid or
6 capitate cymes

4 Cymes dense, globose; leaves 3-5 — 3. Hydrophyllum

4 Cymes elongating like a fiddle-neck;
8 leaves numerous — 4. Phacelia

### 1. Hesperochiron S. Wats.

Small herbs with simple leaves in a basal rosette. Flowers solitary on naked scapes arising from the rosette. Calyx-lobes 5. Corolla saucer-shaped, deeply 5-lobed. Filaments very hairy. Ovary 1-chambered. Style bifid at the apex.

1. H. pumilus (Dougl.) Porter. Low herbs with slender rootstocks ~~sometimes several centimeters long~~; leaves few, ~~all basal~~ the blades 2-5 cm. long, 7-15 mm. wide, tongue-shaped, oblong or ovate, obtuse, narrowed to a slender petiole 1-2 cm. long, entire, glabrous or nearly so; scapes slender, erect, 2-5 cm. long, glabrous or thinly villous; calyx-lobes lanceolate, 6-7 mm. long; corolla lavender, 8-10 mm. long, its lobes broadly ovate, obtuse, very hairy at the base; filaments 6 mm. long; capsule not seen.

Rare within our limits and hardly proper to them. 3 mi. ne. of Worley, St. John 4242, 8023; Moscow, Gail; Fernan Lake, Christ 1005.

## 2. Nemophila Nutt.

Low herbs with alternate pinnate leaves (in our species). Flowers solitary in the axils. Calyx 5-lobed, bearing a small reflexed appendage at each sinus. Corolla minute, saucer-shaped. Capsule 1-chambered.

1. N. explicata Nels. & Macbride. A weak annual sprawling over low herbage, its stems 20-30 cm. long, scabrous along the angles, branching; leaves ~~alternate,~~ 2-3 cm. long, pinnately 5-parted the segments mostly oblong, obtuse, narrowed at the base, 1-1.5 cm. long, 3-6 mm. wide, both surfaces sparsely hirtellous, petioles 1-2 cm. long; flowers ~~solitary at the nodes but~~ opposite the leaves, the pedicels at length 1.5-2 cm. long, deflexed, scabrous; sepals narrowly lanceolate-oblong, 2 mm. long at anthesis, increasing to 6 mm. in fruit, 1-1.5 mm. wide, 1-veined, pectinate-hispid, the appendages 2 mm. long; corolla white, 2 mm. long, the lobes rounded, about equal to the tube; internal appendages none; capsule subglobose, 3 mm. long, hispidulous; seeds solitary, subglobose, 3 mm. long, smooth, the caruncle like a honey-comb.

→ (A form of N. breviflora ~~A.~~ Gray?).

Climbing over low herbage in springy places. Fish Lake, 6000 ft.; Santianne Creek bottom, 3000 ft.; Vanderbilt Gulch.

## 3. Hydrophyllum (Tourn.) L. Water-leaf.

Perennial herbs with horizontal rootstocks, (in our species very short) and fleshy roots. Leaves basal and cauline, alternate, pinnate. Flowers in head-like cymes on axillary peduncles, shorter than the leaves. Calyx-lobes 5. Corolla campanulate, the tube bearing a pair of longitudinal scales opposite each lobe. Filaments hairy at the middle, exserted.

0 Leaf-blades 10-20 cm. long; peduncles 2-4 cm. long,
4 longer than the petiole of the subtending leaf 1. H. albifrons
0 Leaf-blades 4-8 cm. long; peduncles 1-2 cm. long,
4 shorter than the petiole of the subtending leaf 2. H. capitatum

1. H. albifrons Heller. Water-leaf. Perennials with densely fascicled roots and rather numerous basal leaves 30-60 cm. long, their blades ovate in outline, 10-30 cm. long, pinnately parted or divided into 7-9 obovate lobes 2-4 cm. broad which are again commonly once deeply incised and coarsely toothed, the upper surface hirtellous but green, the lower softly and densely hirsute-canescent, silvery, the petioles longer than the blades; flowers in rather compact hemispherical cymes on peduncles 2-4 cm. long, exceeding the foliage; pedicels 6-8 mm. long, villous; sepals 5-7 mm. long, linear-lanceolate, very acute, the margins hispid; corolla 7-10 mm. long, the lobes nearly twice the length of the tube; filaments exserted 5-8 mm.; capsules not seen.

Moist thickets. Valley of the Clearwater; Moscow; Partridge Meadow; Gold Creek.

2. H. capitatum Dougl. Cat's breeches. Inconspicuous herbs 15-40 cm. tall; leaves 3-5, the blades ovate in outline, 4-8 cm. long, pinnately lobed to the midrib, the lobes again irregularly lobed, or entire, the ultimate segments 3-5 mm. wide, mostly obtuse, thinly hirsute; petioles subequal to or longer than the blades; flowers borne in a capitate cyme borne in the upper axil on a short peduncle 1-1.5 cm. long, exceeded by the leaves; calyx lobes oblong-lanceolate, 4-6 mm. long, hispid; corolla bluish or lavender, campanulate, 7-8 mm. long; ovary and capsule hispid, capsule subglobose, 4-5 mm. in diameter; seeds subglobose, reticulately pitted, 1.5 mm. in diameter.

Occasional on gravelly slopes at lower elevations. Priest R. Exp. Sta., 3000 ft., Epling 6144; Moscow Mt., 4500 ft., Epling; Hope, Christ 8.

## 4. Phacelia Juss.

Perennial or annual herbs with alternate and commonly basal leaves, mostly pinnate. Flowers numerous in ~~scorpoid~~ scorpioid cymes, at first more or less dense, elongating and unrolling to resemble a fiddle-neck. Calyx 5-lobed. Corolla campanulate or saucer-shaped, quickly deciduous, the tube bearing small scales within. Style bifid. Capsule 1-chambered, 2-valved.

0 Leaves pinnatifid, the lateral segments 5-7, these
4 again twice or thrice lobed, the ultimate segments
2-6 mm. wide, about twice as long — 1. **P. idahoensis**

0 Leaves entire or if pinnatifid, the lateral segments
4 one or two, much smaller than the middle one

2 Corolla 9-10 mm. long, lavender — 2. **P. linearis**

2 Corolla 4-6 mm. long, white or at most merely
6 tinged with blue

4 Leaves commonly 3-foliolate, the pubescence
8 spreading-hispid; inflorescence tending to
be elongate and virgate — 3. **P. heterophylla**

4 Leaves commonly entire, the pubescence more
or less appressed hispid, with a finer denser
8 pubescence which makes the plant hoary or
white; inflorescence tending to be a convex
cluster or a series of such clusters, not
virgate — 4. **P. leucophylla**

1. **P. idahoensis** Henderson. Perennials with ~~a~~ and a dense tuft of ~~basal leaves and~~ erect virgate stems 40-70 cm. tall ~~puberulent;~~ basal leaves 7-25 cm. long, oblanceolate in outline, irregularly pinnatifid, the segments in 3-7 uneven pairs, confluent toward the apex, mostly oblong, again irregularly incised, both surfaces thinly pubescent with appressed hairs; ~~cauline leaves similar on gradually reduced petioles, smaller;~~ flowers few in small lateral cymes which elongate to 1.5 cm., borne on peduncles .5-1.5 cm. long, at maturity forming a strict oblong panicle 8-30 cm. long; sepals linear, 3.5-4 mm. long, hispid; corolla blue, campanulate, 6 mm. long, the lobes 2 mm. long, recurved; stamens 9 mm. long, the anthers yellow; ovary and capsule hispid, the latter 5 mm. long. A little known species.

Infrequent in rather brushy meadows at low elevations, but locally abundant especially between Bovill and Santa.

no H

→ Clarkia, Epling and Offord 8167, 8232; Santianne Cr., 950 m., Leiberg 1024; Bovill, Epling and Putnam; ~~Emida, Christ 1512~~ Emida, Christ 1512.

2. P. linearis (Pursh) Holz. Annual, 10-50 cm. tall, unbranched or markedly branched, the branches ascending, hirtellous and thinly hispid; leaves sessile, simple and linear or cleft into 3-5 linear segments, the blades or their ultimate segments 3-7 cm. long, 2-6 mm. wide, green, thinly hispid; ~~flowers in~~ showy scorpoid cymes without bracts, 3-20 cm. long; sepals linear, 4-5 mm. long in flower, increasing ~~to 6-8 mm.~~ in fruit, hirtellous and bristly-hispid, scarcely .5 mm. wide; corolla funnelform, lavender, fading to blue, 8-11 mm. long; stamens erect, anthers deep-blue, scarcely exserted, subequal to the corolla; the filaments pilose; capsule ovoid, acuminate, 5-6 mm. long, hirtellous; seeds 1.2 mm. long, dark brown, deeply pitted.

Infrequent in rather dry rocky soil at lower altitudes. → Fox Cr., 3000 ft., Epling 6140; Upper Priest Lake, 3000 ft., Epling 7202; Clearwater and Coeur d'Alene Rs., Geyer 613; Pend Oreille R., Lyall; Arrow, Epling; Hope, Epling.

no H

3. *P. heterophylla* Pursh. Biennial or perennial ~~habit~~ with numerous basal leaves, *3-lobed* or entire, their blades 4-12 cm. long, the principal lobes mostly elliptical, the lateral lobes spreading, much smaller, the stems and both surfaces of the leaves *hispid with harsh hairs* and usually more or less hirsute with shorter hairs, *green* not canescent; inflorescence 20-150 cm. tall, elongate, usually single, *very straight*, the ascending branches typically appressed; sepals 3-5 mm. long hirtellous and hispid, linear, linear-oblong or linear-lanceolate, increasing to 7-8 mm. in fruit; corolla 4-6 mm. long, *white*, becoming yellowish especially below the sinuses, the appendages oblong, half as long as the corolla; stamens thinly woolly, about *twice as long as the corolla*, exserted; capsule ovoid, 4 mm. long, acuminate, hispid; seeds brown, pitted, rather acute at one end.

Prevalent in the southern part of our region especially in the drainage of the Clearwater R.; apparently a complex of several forms of which the robust hispid plant of the Clearwater canyon appears to represent ~~the~~ Lewis? plant which was described by ~~of~~ Pursh; the elegant smaller plant of more northern drainages (*P. hastata* Dougl.) and a greener more lax form with ascending stems and entire leaves (*P. leptosepala* Rydb.) seem scarcely different and both tend to merge with the following species.

4. *P. leucophylla* Torrey. Biennial or perennial ~~habit~~ with numerous basal leaves and *several slender stems curving upwards*, 30-50 cm. tall, less frequently 70 cm., the leaves *prevailingly entire*, narrowly elliptical, 3-8 cm. long, .5-2 cm. wide, tapering to petioles about as long as the blades, both surfaces hispid with more or less appressed hairs and *typically canescent with shorter dense pubescence*; branches of the inflorescence ascending loosely and forming a convex cluster; sepals 3-5 mm. long, hirtellous and hispid, linear, linear-oblong or linear-lanceolate, increasing to 7-8 mm. in fruit; corolla 4-6 mm. (usally about 5 mm.) long, *white*,

becoming yellowish below the sinuses, the appendages oblong, half as long as the corolla; stamens thinly woolly, about twice as long as the corolla, exserted; capsule ovoid, 4 mm. long, acuminate; seeds brown, pitted, rather acute at one end.

Prevalent in the northern part of our region, in the Kootenai and Coeur d'Alene valleys. The typical plant is ~~of the~~ found in a region to the southeast, Fremont's collection, the type, coming from "Goat Island, upper N. Fork Platte", ~~30 VII 1842,~~ near present-day Alcova, Natrona Co., Wyo.

## Boraginaceae. Borage Family.

Herbs with simple, mostly alternate leaves without stipules. Flowers perfect, regular, borne either in one-sided coiled cymes which elongate during the period of flowering or in cymose panicles. Calyx usually 5-lobed or toothed, persistent. Corolla tubular, 5-lobed, the lobes erect, spreading or rotate, the throat often bearing a crown of 5 small scales or protuberances. Stamens 5, inserted on the corolla tube, usually included. Ovary superior, deeply 4-lobed, splitting in fruit into 4 1-seeded nutlets; style 1. =/

0 Nutlets armed with stout prickles barbed at the apex 1. Lappula

0 Nutlets wrinkled or papillose or smooth

  2 Flowers yellow

    4 Flowers solitary or clustered in the axils of
      8 the upper leaves, exceeded by the leaves;
      8 nutlets smooth 2. Lithospermum

    4 Flowers in elongated more or less naked one-
      8 sided coiled cymes; nutlets rough 3. Amsinⓒkia

  2 Flowers white or blue

    4 Calyx lobes subequal to or shorter than the
      8 calyx-tube 4. Myosotis

    4 Calyx-lobes nearly distinct, the tube little
      8 or none

      6 Flowers blue (rarely white), the limb erect;
        10 stamens inserted in the throat, included
        10 within the limb 5. Mertensia

      6 Flowers white, the limb spreading; stamens
        10 inserted within the tube and included
        10 by it

        8 Nutlets smooth and shining or at most
          12 papillose 6. Cryptantha

        8 Nutlets wrinkled, dull 7. Plagiobothrys

## 1. Lappula (Riv.) Moench. Stickseed.

Erect annual or perennial herbs with alternate hispid leaves. Flowers small, blue, in one-sided coiled cymes. Calyx 5-parted. Corolla tubular-funnelform, the tube short, the throat closed by 5 scales. Stamens included. Nutlets armed with stout prickles barbed at the apex.

1. L. echinata Gilib. Annuals with slender erect or decumbent thinly appressed-hirsute stems 20-60 cm. tall, branching in the inflorescence; leaves 1.5-5 cm. long, 2-6 mm. wide, oblong or oblong-lanceolate, sessile, mostly obtuse, hispid-hirsute, the hairs more or less appressed, passing into the similar but much reduced bracts; calyx-lobes 2 mm. long in flower, linear-oblong, hispid-hirsute, increasing to 3.5-4 mm. and spreading in fruit; corolla blue, scarcely 2.5 mm. long; nutlets 3 mm. long, narrowly ovoid, acute at the apex, bearing around the margin a double row of stout rigid prickles about 1 mm. long. ~~which are barbed at the apex.~~

In dry soil on low hillsides.

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Cynoglossum officinale L. Common Hounds Tongue. Nutlets armed with peg-like prickles. Corolla blue, 5-6 mm. long. ——May be expected as a weed.

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## 2 Lithospermum (Tourn.) L. ~~Puccon.~~ Puccoon.

Erect hirsute leafy perennial herbs with several stems from a woody caudex; leaves alternate. Flowers clustered in the upper axils, exceeded by the leaves. Calyx 5-parted. Corolla campanulate-funnelform, yellow. Anthers included. Nutlets white and shiny, smooth.

1. L. ruderale Dougl. Stems 25-40 cm. tall, usually several from a woody caudex, erect, virgate, spreading-hirsute; leaves lanceolate or oblong-lanceolate, 3-8 cm. long, 5-10 mm. wide, acute, sessile, hirsute or nearly glabrous, greyish-green; flowers in dense leafy clusters in the upper axils; calyx-lobes linear, 4-6 mm. long; corolla 8-10 mm. long, campanulate-funnelform, greenish yellow, pubescent within; nutlets 4-4.5 mm. long, whitish, bony, shortly acuminate or acute. (L. lanceolatum Rydb.).

On dry hillsides at lower elevations.

## 3. Amsinckia Lehm.

Weedy annuals with alternate hispid leaves, the hairs coarse, pustulate at the base. Flowers perfect, in elongated, mostly one-sided coiled cymes. Calyx lobes normally 5, sometimes 4 or 3 by union of two or more. Corolla tubular-funnelform, the throat open but sometimes with more or less distinct folds. Stamens included. Nutlets 3-angled, ~~roughened by papillae or wrinkles or both.~~

1. A. micrantha Suksdorf. Itchweed. ~~Erect weedy annual~~ herbs rough hispid Cap. throughout with whitish hairs, 40-80 cm. tall; leaves lanceolate or narrowly ovate, 5-12 cm. long, entire, the upper leaves sessile; cymes elongating to as much as 30 cm. nearly naked, hispid; calyx-lobes lanceolate, acute, 3 mm. long in flower, 5-7 mm. long in fruit, densely hispid; corolla orange yellow, 5-6 mm. long, funnelshaped, the limb 1 mm. long; nutlets 2-2.5 mm. long, dark gray, longitudinally 3-angled on the back, roughened with small irregularly disposed papillae.

Frequent in meadows or along roadways in the grassland.

## 4. Myosotis (Rupp.) L. Forget-me-not.

Annuals or perennials with alternate leaves. Flowers small, cymose or racemose. Calyx 5-lobed. Corolla blue or white, rotate, the throat closed by conspicuous protuberances. Nutlets smooth and shining.

O Perennial; corolla 6 mm. broad; nutlets black. 1. M. laxa

σ Annual; corolla 1-1.5 mm. broad; nutlets silvery or brown.

2 Calyx-lobes shorter than the tube, becoming 3 mm. long in fruit. 2. M. virginica

2 Calyx-lobes longer than the tube, becoming 3-4.5 mm. long in fruit. 3. M. stricta

1. M. laxa Lehm. Perennials with slender creeping rootstocks; stems lax, reclining on other foliage, appressed-pubescent; leaves crowded or distant, 2-7 cm. long, 4-8 mm. wide, oblong or oblanceolate, obtuse, more or less narrowed to the base, sessile, appressed-pubescent to subglabrous; flowers numerous in lax naked coiled cymes 20-30 cm. long, on slender pedicels 3-4 mm. long, increasing to 6-8 mm. in fruit; calyx 2 mm. long in flower, appressed-hispid, the lobes ovate, shorter than the tube, increasing to 2.5 mm. in fruit, the lobes then about 1 mm. long; corolla a pale pure blue, 6 mm. broad; nutlets black, 1.5 mm. long, the margins acute, both faces very smooth.

Infrequent in boggy or swampy ground under shrubbery.

no H Port Hill, Epling 10486; Pritchard, 3000 ft., Epling and Houck 10189.

2. M. virginica (L.) BSP. var. macrosperma (Engelm.) Fern. Annual with erect branching thinly hirsute stems 10-40 cm. tall; leaves 1-2 cm. long, the lower oblanceolate, the upper oblong, obtuse at both ends, hirsute; flowers in naked coiled cymes 10-20 cm. long, on pedicels 1-2 mm. long; calyx 2 mm. long in flower, hispidulous with hooked hairs especially at the base, the lobes shorter than the tube, increasing to 3 mm. in fruit, the lobes then subequal to the tube; corolla blue, 1.5 mm. long, 1 mm. broad; nutlets silvery, 1.2 mm. long, the margins acute. (M. macrosperma Engelm.).

Moist ground near Santa, Epling, Wyckoff and Offord.

3. M. stricta Link Annual with erect simple or branching hirsute stems 5-20 cm. tall; leaves 5-15 mm. long, the lower spatulate, short petioled, the upper narrowly elliptic or lanceolate, sessile; flowers in nearly naked racemes; calyx 1.5-2 mm. long in flower, hispid with hooked hairs, the lobes longer than the tube, increasing to 3-4.5 mm. in fruit; corolla blue with a yellow tube, 1.5 mm. wide; nutlets brown, 1 mm. long. (M. micrantha sensu Johnston).

Recent introduction from Eurasia, occasional in grasslands and waste ground.

## 5. Mertensia Roth. ~~Bluebells.~~ ~~Chiming Bells.~~

Perennial herbs with erect leafy stems; leaves alternate. Flowers perfect, in terminal cymes or cymose panicles. Calyx deeply 5-cleft, persistent. Corolla tubular-funnelform or trumpet-shaped, blue or rarely white. Stamens included, the filaments usually flattened, inserted in the throat of the corolla. Nutlets attached at the base.

| | |
|---|---|
| Stems 10-20 cm. tall; corolla 15-20 mm. long | 1. M. oblongifolia |
| Stems 60-100 cm. tall or more; corolla 10-12 mm. long | 2. M. paniculata |

**1. M. oblongifolia** (Nutt.) Don. Stems solitary or two or three arising from a globose tuber about 1 cm. in diameter, 10-20 cm. tall, unbranched, glabrous; leaves few, the lowermost obovate, 1.5-3 cm. long, the upper oval or oblong, 2.5-5 cm. long, obtuse or rounded, narrowed at the base, nearly glabrous or papillose or more or less glaucous; flowers showy, in one or two loose more or less nodding cymes, on slender pedicels 2-4 mm. long; calyx-lobes lanceolate, 3-5 mm. long, mostly very acute, glabrous and often glaucous, the margins usually ciliolate; corolla deep blue, rarely pure white, 1.5-2 cm. long, tubular, the limb 4 mm. long; ~~stamens included within the limb, inserted in the throat, the filaments flattened~~ nutlets 2 mm. long, rounded and scabrous on the back.

Frequent on gravelly open slopes.

**2. M. paniculata** (Ait.) Don. Stems several or numerous, erect from a woody crown, 60-100 cm. tall or more, ~~unbranched save in the inflorescence,~~ glabrous or sparingly hispid; leaves mostly ovate, or the uppermost ovate-lanceolate or oblong-lanceolate, 6-14 cm. long, 2-6 cm. broad, gently acuminate, rounded at the base and narrowed to a petiole 1-4 cm. long, both surfaces entirely glabrous or papillose, or more or less scabrous or hirtellous, glaucous or green; flowers in lax terminal panicles, the branches of which arise in the uppermost axils, pedicels 2-10 mm. long, 1-2 cm. in fruit, glabrous or more commonly hispidulous, slender; calyx-lobes triangular-lanceolate, 1.5-3 mm. long in flower, 3-4.5 mm. long in fruit, acute, glabrous and ciliate or more commonly hispidulous; corolla pink, then blue, tubular-funnelform, 9-12 (or 15) mm. long, ~~rarely as long as 15 mm.~~ the tube approximately subequal to the limb; stamens seated in the throat, ~~included within the tube,~~ the filaments ~~flattened,~~ subequal to the anthers; nutlets silvery, 3-4 mm. long, rugose and papillose. (M. membranacea Rydb.; M. pratensis Heller.).

Common and variable throughout our region, in meadows and along streams.

## 6. Cryptantha Lehm.

Annual usually branching herbs with alternate entire leaves, or the lowermost sometimes opposite. Flowers perfect, regular, borne in one-sided coiled cymes. Calyx 5-lobed, increasing somewhat in fruit. Corolla white, the limb saucer-shaped, the tube short, the throat closed by 5 small scales. Stamens 5, included. Nutlets papillose or smooth, attached to the receptacle in the lower half.

o Corolla 6-7 mm. long. 1. **C. Hendersoni**

o Corolla 2.5 mm. long.

2 Calyx-lobes 2.5 mm. long in fruit, linear, frequently exceeded

6 by the very coarse hairs which cover them.

c

2. **C. affinis.**

2 Calyx-lobes 4.5-5 mm. long in fruit, linear-lanceolate,

6 densely hispid. 3. **C. Torreyana**

1. C. Hendersoni (A. Nels.) Piper. Erect, little-branched annuals 10-30 cm. tall, covered throughout with spreading hispid hairs; leaves in a basal rosette, the cauline alternate, all oblong, or oblong-oblanceolate, 2-6 cm. long, 2-6 mm. wide, obtuse, hispid with spreading hairs; calyx-lobes linear, 3 mm. long in flower, densely and coarsely hispid; corolla white, 6-7 mm. long; [illegible] nutlets not seen but ~~fide~~ according to I. M. Johnston either smooth or variously tuberculate, ovoid or lance-ovoid, the back low-convex.

Little Potlatch canon, Dunkle; Julietta, Darlington.

2. C. affinis (A. Gray) Greene. Annuals 15-30 cm. tall with ascending branches, hispid-hirsute throughout; leaves oblong, 1-6 cm. long, 2-8 mm. wide, obtuse, narrowed toward the base, hispid-hirsute; cymes bracteate below, mostly naked above; elongating in fruit; calyx-lobes linear, 2 mm. long in flower, frequently exceeded by the very coarse hispid hairs upon their surfaces, 2.5 mm. long in fruit; corolla white, scarcely 2.5 mm. long; nutlets narrowly ovoid, acute, smooth and shining, mottled.

In dry ground along roadsides or in meadows.

3. C. Torreyana (A. Gray) Greene. Erect or decumbent annuals usually diffusely branched, 10-50 cm. tall, thinly spreading-hispid throughout; leaves linear-oblong, or narrowly oblanceolate, 1-6 cm. long, 2-5 mm. wide, obtuse, hispid; cymes remaining dense and subglobose in fruit; calyx-lobes 2-2.5 mm. long in flower, 4.5-5 mm. long in fruit, linear-lanceolate, acuminate, densely hispid, connivent and erect; corolla white, scarcely 2.5 mm. long; nutlets ovoid, very acute, smooth, shining, mottled.

In dry soil along roadways and in meadows at low elevations.

## 7. Plagiobothrys Fisch. & Meyer. Popcorn Flower.

Small annuals with alternate hispid leaves often forming a basal rosette or the lowermost opposite. Flowers small, white, in one-sided, coiled cymes, Calyx 5-parted. Corolla white, the limb saucer-shaped, the tube short, the throat closed by small protuberances. Stamens included. Nutlets wrinkled, attached at the base.

0 Pubescence of stems spreading; corolla 4 mm. long — 1. P. tenellus

0 Pubescence of stems appressed; corolla 1.5 mm. long — 2. P. scopulorum

1. P. tenellus (Nutt.) A. Gray. Annuals 5-20 cm. tall, usually branching from the base, the stems ascending, spreading hirsute; leaves of basal rosette 1-2 cm. long, 2-3 mm. wide, oblanceolate, hirsute, the cauline few, mostly oblong-lanceolate, 5-10 mm. long; calyx-lobes linear-oblong, 2.5-3 mm. long, increasing somewhat in fruit, hispid with yellow hairs; corolla white, 4 mm. long; nutlets brownish, 1.5-2 mm. long, shining, the back rounded, with a low median ridge and numerous fine transverse ridges.

In meadows and along roadways in the grasslands.

2. P. scopulorum (Greene) Johnston. Annuals 5-20 cm. tall, the stems usually branching profusely at the base, forming a small bushy plant, sometimes nearly simple, appressed-hirtellous; lowermost leaves opposite, linear, 1-3 cm. long, 1-2 mm. wide, the upper similar, alternate, all hirtellous; calyx-lobes linear-lanceolate, 1.5 mm. long in flower, hispid, increasing to 2.5 mm. in fruit; corolla white, scarcely 1.5 mm. long; nutlets silvery-green, 1.5 mm. long, narrowly ovoid, acute, with an acute ventral ridge extending below the apex on the dorsal side as well, the wrinkles acute, obliquely transverse.

At low elevations in pastures and meadows in muddy ground which later becomes dry, especially about the margins of vernal pools.

## Convolvulaceae. Morning Glory Family.

Twining or trailing herbs with alternate leaves, the stipules wanting. Flowers regular, perfect. Calyx 5-lobed. Corolla funnelform, 5-lobed, plaited, the plaits convolute in the bud. Stamens 5, the filaments partly adnate to the corolla tube. Ovary superior, 2-chambered; style 1. Fruit a 2-chambered capsule sometimes falsely 4-chambered or 1-chambered. Ovules and seeds 1 or 2 in each chamber.

### Convolvulus (Tourn.) L. Bindweed.

Flowers axillary showy. Sepals 5, unequal. Corolla margin nearly entire, plaited between the shallow lobes. Capsules globose. Ovules and seeds usually four.

| | |
|---|---|
| ○ Corolla 2.5 cm. across | 1. C. arvensis |
| ○ Corolla 5 cm. across | 2. C. sepium |

1. C. arvensis L. Field Bindweed. Stems prostrate, trailing; leaves glabrous, variable, 2.5-4 cm. long, mostly triangular or ovate ~~in general outline~~, either arrowshaped or hastate, the basal lobes acute, usually spreading; flowers 1-2 in the axils on peduncles 3-5 cm. long; corollas 2.5 cm. broad, white, usually pinkish along the plaits.

An infrequent weed introduced from Europe; Coeur d'Alene; Hope.

2. C. sepium L. → Stems prostrate, trailing; leaves glabrous, mostly arrow-shaped, 4-6 cm. long, the basal lobes truncate, obtuse; flowers usually solitary in the axils on peduncles about 1 cm. long; corollas pure white, 5 cm. broad.

An infrequent weed introduced from Europe; Hope; Lake Pend Oreille.

## SOLANACEAE. Potato Family.

Herbs or shrubs with alternate leaves without stipules. Flowers perfect, regular, borne in axillary umbels or cymes. Calyx 5-lobed, the lobes subequal. Corolla 5-lobed. Stamens 5, inserted on the corolla-tube and alternate with the lobes. Ovary superior, 2-chambered; style 1. Fruit a berry or capsule.

### Solanum (Tourn.) L. Nightshade.

Herbs with toothed, lobed or entire leaves. Corolla whitish or purple, saucer-shaped or with recurving petals, plicate in the sinuses. Stamens erect, approximate, forming a column around the style.

0 Flowers white or bluish; herbage glabrous — 1. S. nigrum

0 Flowers deep purple; herbage pubescent with straight hairs — 2. S. Dulcamara

**1. S. nigrum L.** An annual with weak spreading stems, glabrous; leaves mostly triangular-ovate, 4-6 cm. long, on petioles 1-3 cm. long, glabrous, the margins sinuately dentate; flowers dingy, inconspicuous, few, on peduncles 1-2 cm. long; pedicels 6-12 mm. long; calyx-lobes broadly ovate, obtuse, 1-1.5 mm. long; corolla whitish, 4-5 mm. broad; anthers 2 mm. long, subsessile; berry black, globose, 5-6 mm. in diameter, poisonous.

Occasional in waste places. Hope, Dunkle; Sandpoint, Epling.

**2. S. Dulcamara L.** Perennial herbs with stems more or less prostrate or decumbent, 40-80 cm. long, thinly pubescent with straight hairs; leaves mostly ovate in outline, [illegible]-8 cm. long, acuminate, rounded at the base, entire or sinuately and irregularly lobed, commonly with one or two spreading lobes near the base, both surfaces thinly pubescent with straight hairs, petioles 1-4 cm.

long; flowers several in axillary cymes borne in the upper axils, the peduncles of which are 1-5 cm. long; pedicels slender, 6-8 mm. long; calyx scarcely 2 mm. long, the sepals deltoid or hemispheric, [illegible] mm. long; petals nearly free, lanceolate, [illegible]-9 mm. long, recurved in anthesis, deep violet with two green glands at the base of each on the tube; stamens yellow; berries ovoid, red, [illegible]-7 mm. in diameter.

An occasional weed, introduced from Europe. Nome, Euling.

## Scrophulariaceae. Figwort Family.

Annual or perennial herbs, ours rarely shrubs ~~or trees~~. Leaves alternate or opposite, frequently in basal tufts. Stipules none. Flowers perfect, mostly irregular, commonly 2-lipped. Sepals 5 or 4, more or less united. Stamens usually 4, in two pairs, sometimes with a fifth sterile filament, less often 5 or 2, all more or less adnate to the corolla-tube. Ovary superior, 2-chambered; style 1. Fruit a 2-chambered, 2-valved capsule, either loculicidal or septicidal.

0 Anther-bearing stamens 5, the filaments of 2 or more
4 densely woolly — 1. Verbascum

0 Anther-bearing stamens 4 (in Penstemon with a fifth
4 bearded sterile filament) or 2

  2 Corolla with a prominent sharp spur at the base — 2. Linaria

  2 Corolla not spurred

    4 Small tufted ~~creeping~~ herb 2-4 cm. tall, the flowers 2-2.5 mm. long; leaves linear-spatulate, 1-2 mm. wide — 3. Limosella

    4 Erect plants usually much larger, the flowers
    8 rarely shorter than 5 mm.; leaves otherwise

      6 Stem leaves distinctly alternate, those at
      10 the base sometimes in tufts

        8 Stamens 2; corolla slightly irregular
        12 or wanting — 4. Synthyris

        8 Stamens 4; corolla strongly 2-lipped

          10 Anther-sacs dissimilar, the inner one
          14 pendulous by its apex

            12 Calyx more or less equally 4-cleft;
            16 lower lip of corolla subequal to the upper, pouch-like — 5. Orthocarpus

            12 Calyx more deeply cleft at front and
            16 rear than laterally, the two lateral lobes joined nearly or quite to the apex, the calyx then appearing 2-cleft; upper lip of corolla usually much longer than lower — 6. Castilleia

          10 Anther-sacs similar, parallel, the inner
          14 not pendulous — 7. Pedicularis

6 Stem-leaves opposite (or bracts alternate in Veronica)

8 Stamens 2

10 Corolla yellow with white limb, tubular, 2-lipped; capsule
~~ovoid~~ → ~~turgid~~ plump 8. Gratiola

10 Corolla bluish or white, saucer-shaped,
14 4-lobed, slightly irregular; capsule
~~obcordate~~ → flattened laterally 9. Veronica

8 Stamens 4, a fifth sterile filament ~~usually~~ → often
12 present, either obvious or represented by
a scale or gland on the upper surface of
the corolla

10 Sterile filament elongated, resembling
14 the other filaments but usually ~~woolly~~ → hairy
at the apex

12 Leaves expanded at the base, sheathing
16 the stem; flowers in a simple raceme,
few 10. Chionophila

12 Leaves not expanded or sheathing at the
16 base; flowers in open panicles or more
or less contracted into cylindrical
spikes, numerous 11. Penstemon

10 Sterile filament not prominent, represented
14 by a scale or gland on the upper surface
of the corolla, or wholly wanting

12 Corolla with 4 unequal erect lobes, the
16 anterior lobe deflexed, more or less
appressed against the tube 12. Scrophularia

12 Corolla 2-lipped, the upper lip 2-lobed,
16 the lower 3-lobed, spreading

14 Middle lobe of lower lip pouch-like,
18 laterally compressed, enclosing the
stamens 13. Collinsia

14 Middle lobe of lower lip neither
18 pouch-like nor compressed

16 Calyx-tube distinctly 5-angled;
20 capsule ovoid, not compressed,
the seeds numerous 14. Mimulus

Calyx-tube not markedly 5-angled;
capsule obliquely ovate, strongly
compressed; seeds 2-4 15. Melampyrum

## 1. Verbascum (Bauhin) L. Mullein

Biennial erect virgate herbs with basal leaves forming a rosette, the cauline smaller, alternate. Flowers perfect in terminal racemes, spikes or panicles. Sepals 5. Corolla yellow or white, saucer-shaped, nearly regular. Stamens 5, all fertile. Fruit a septicidal capsule.

Plants hoary, very densely covered with branched hairs 1. V. Thapsus
Plants green, glabrous or sparingly glandular 2. V. Blattaria

1. V. Thapsus L. Flowering stem 60-200 cm. tall, leafy, densely woolly; leaves pale green, erect or ascending, 12-60 cm. long, mostly oblanceolate, obtuse, the upper acute, narrowed at the base to a decurrent, adnate petiole, the margin obscurely crenate, both surfaces densely woolly with branched matted hairs; flowers in a terminal spike elongating to 30-40 cm. or more; bracts lanceolate, acuminate, subequal to the calyces; calyx subsessile 10-12 mm. long, campanulate, woolly, the lobes somewhat

longer than the tube, lanceolate, acuminate; corolla clear yellow, 15 mm. long, the lobes rotund-ovate, subequal to the tube, hairy without, the lowermost slightly larger; stamens included, the upper three somewhat shorter, yellow-pilose, the lower nearly glabrous; style subequal to the stamens, green, the stigma capitate.

Frequent, occurring along roads and in waste places; introduced from Europe.

2. V. Blattaria L. Stems 30-60 cm. tall or more, glabrous; upper leaves 3-5 cm. long, oblong-elliptical, obtuse or acute, sessile or the lower narrowed to a petiole, crenate-dentate, sometimes lobed, both surfaces glabrous; flowers in showy racemes often half the length of the stem or more; pedicels 8-10 mm. long; calyx glandular; corolla yellow or white, 2-2.5 cm. broad, the filaments densely purple-villous; capsule globose, 6-7 mm. in diameter.

A frequent weed of roadsides and waste places, introduced from Europe.

## 1. Linaria ~~(Tourn.) L.~~ (Bauhin.) Mill.

An erect ~~annual~~ herb from perennial rhizomes with unbranched stems and alternate leaves with numerous short secondary branchlets fascicled in their axils. Flowers ~~yellow and orange~~ in dense spikes, showy. Sepals 5. Corolla 2-lipped, the tube spurred at the base. Stamens 4, paired. Capsule opening by pores near the apex.

1. L. vulgaris Hill. Butter and Eggs. Stems 40-60 cm. tall, usually gregarious, the leaves linear-elliptical, 4-5 cm. long, entire; flowers yellow, the throat orange, hairy.

Frequent along roadways and railways, as near Wallace; introduced from Europe.

## 3. Limosella (Lindern) L.

a

Small aquatic herbs, ours tufted stoloniferous annual, with leaves basal. Corolla nearly regular, shallowly campanulate, 5-lobed. Stamens 4, the filaments adnate to the corolla-tube. Capsule 2-chambered at the base, 1-chambered above.

Flowers solitary, on slender peduncles. Sepals 5.

1. L. aquatica L. Leaves linear-spatulate, 2-5 cm. long, 1.5-2 mm. broad, rather fleshy; peduncles 1-3 cm. long, shorter than the leaves; calyx 1-1.5 mm. long, increasing to about 2 mm. in fruit, the lobes triangular-ovate; corolla 2-2.5 mm. long, white or pinkish, capsules globose, 2.5 mm. long.

Creeping and rooting in mud along streams or small pools. Lower valley, Clark Fork, Leiberg 1676.

## 4. Synthyris Benth.

Perennial herbs with rather stout rootstocks and chiefly basal leaves, the cauline alternate. Flowers in racemes. Sepals 4. Corolla saucer-shaped, slightly irregular or wanting. Stamens 2, exserted. Capsule compressed, but not strongly so, suborbicular, more or less notched at the apex, loculicidal. Seeds flat.

o Plants glabrous, the corolla blue; leaves reniform-rotund *S. missurica*
o Plants villous throughout, the corolla wanting;, or
rudimentary; leaves ovate, truncate at the base *S. rubra*

*1. S. missurica* (Raf.) Pennell. Glabrous herbs, the leaf blades *rotunde* =/ *reniform*, 4-5 cm. in diameter, the margins doubly crenate-dentate, the primary teeth 3-4 mm. tall, the secondary teeth 1-2 mm. tall, the sinus open, the petioles 5-10 cm. long; flowering stems axillary, erect or ascending, 15-25 cm. tall, naked below or with a few small floral leaves 3-5 mm. in diameter, the bracts subrotund or ovate, sessile, 3-5 mm. in diameter; pedicels 2-5 mm. long; sepals oblong-ovate, obtuse, 3-4 mm. long; corolla *blue*, 6-7 mm. long; capsule 5-6 mm. in diameter, notched at the apex, the style somewhat shorter than the body. (*Veronica reniformis* Pursh; *V. Purshii* G. Don, not *S. reniformis* (Dougl.) Benth.).

On high mountain tops and ridges. Divide betw. St. Joe and Clearwater rs., 6200 ft., *Leiberg 1238*.

*2. S. rubra* (Dougl.) Benth. Villous herbs, the leaves of the flowering stems well developed, not bractlike, the basal leaf-blades *ovate* or even subrotund, 5-11 cm. long, obtuse, *subtruncate at the base*, the margins crenate-dentate, irregularly or not at all doubly toothed, the teeth .5-2 mm. tall, both surfaces villous, becoming glabrate, the petioles 3-10 cm. long; flowering stems axillary, erect, .15-50 cm. tall, *leafy*, the floral leaves ovate, sessile, subentire, 1-3 cm. long, the bracts similar, smaller, even subulate; sepals ovate or elliptical, yellow woolly, viscid, 3-6 mm. long; corolla none; filaments reddish-purple, 4 mm. long; capsule somewhat broader than long, 5-5.5 mm. broad, woolly; seeds disc-shaped, 2 mm. in diameter. (Besseya rubra (Dougl.) Rydb.).

=/

Frequent in open gravelly slopes usually at low elevations.

Ours

## 5. Orthocarpus Nutt. Owl's clover.

l.c. Erect annual herbs with alternate leaves. Flowers in terminal leafy spikes, the bracts usually colored. Sepals 4. Corolla strongly irregular, 2-lipped, the upper lip (galea) straight or arched, subequal to the lower which is more or less saccate and often 3-lobed. Stamens 4, paired, ascending under the galea, the anther sacs dissimilar. Fruit a loculicidal capsule.

O Bracts green, cleft into attenuate segments; 4 ~~inflorescence densely pubescent;~~ galea straight or nearly so~~; anterior lip with much inflated pouch as wide as or wider than long, terminating in three subulate free lobes~~ 1. O. hispidus

O Bracts red, broadly rounded, with one or two pairs of coarse lobes at the apex; 4 ~~inflorescence puberulent, the bracts and calyx-lobes setose~~; galea strongly decurved at apex~~; anterior lip with less inflated pouch clearly longer than wide, without terminal free lobes.~~ 2. O. tenuifolius

1. O. hispidus Benth, ~~A slender annual~~ 15-30 cm. tall, ~~the~~ stems Cap. unbranched or with one or two erect branches, hispid and somewhat glandular throughout; leaves sessile, linear-lanceolate, attenuate, 3-5 cm. long, entire or with one or two slender lobes; spikes about half as long as the stems, the bracts green, cleft into attenuate segments, ~~resembling the leaves~~ leaflike; sepals lanceolate, 3-4 mm. long, the mature calyx tube somewhat distended, 6-7 mm. long; corolla white, 12-15 mm. long, the galea straight, awl-shaped, 3-5 mm. long, acute, the lip inflated, erect, shorter than the galea, as wide or wider than long, 3-pouched, terminating in 3 free greenish lobes; capsule 6-7 mm. long.

In grassy open places at low elevations. Near Moscow; St. Maries R.; Santa.

2. O. tenuifolius (Pursh.) Benth ~~An erect annual~~ 15-30 cm. tall, ~~the~~ stems usually branching, the branches ascending, pubescent, with scattering longer pilose hairs; leaves 1-3 cm. long, sessile, pinnately 3-5-lobed, the lobes linear, attenuate; spikes dense, 2-5 cm. long, the bracts hispid on the margins, rose-purple toward the tip or some whitish, ovate, entire or with one or two pairs of smaller acute lobes, the middle lobe 4-6 mm. broad, rounded or truncate, puberulent; calyx 5-6 mm. long, the lobes subulate, 3 mm. long, the corolla exserted from the rear sinus; corolla yellowish or purplish toward the apex, 13-15 mm. long, the galea arched at the apex, 3.5-4 mm. tall, the lip longer than wide, 3.5 mm. long, without free lobes; capsule 6 mm. long, compressed-oblong, minutely puberulent; seeds 1 mm. long, longitudinally wrinkled.

On dry hillsides at low elevations; usually under lodgepole pine. Tomers Butte; Three Fks. Sta.; Cocolalla; Spirit Lake.

## 6. Castilleia Mutis. Indian Paint Brush

Perennial herbs with several stems arising from a more or less woody caudex, bearing alternate sessile leaves. Flowers in dense spikes, the bracts usually brightly colored. Calyx 4-lobed, unequally cleft, the median cleft deeper, the lateral cleft shallower or the lobes merely 2-toothed. Corolla strongly 2-lipped, the upper (galea) more or less arched, the lower usually small, 3-lobed, hardly saccate; stamens 4, paired, the anther sacs unequal. Fruit a loculicidal capsule. The variations in this genus in flower color and other characters involving the accessory floral parts, which are characteristic and well known, are probably due in considerable part to the hemi-parasitic relationships that these plant engage in with host other types, especially ~~leguminous and compositaceous [illegible] plants~~. Leguminosae and Compositae.

0 Lip at least half the length of the galea; leaf-blades pinnatifid;
4 bracts yellow or yellowish

2 Lip pouch-like, about as long as the galea; calyx-lobes lanceolate, acute or acuminate, united laterally somewhat higher than medianly — 1. C. *gibba*

2 Lip scarcely inflated, about half the length of the galea; calyx-lobes triangular, obtuse, united laterally nearly to apex — 2. C. *lutea*

0 Lip less than half the length of the galea; leaf-blades entire or some
4 pinnatifid-lobed, prevailingly lanceolate

2 Bracts yellowish, sometimes tinged with red; calyx-lobes laterally free ~~laterally~~ 1-2 mm.; corolla about 15 mm. long, the lip about 1/3 the length of the galea — 3. C. *lutescens*

2 Bracts red; corolla with lip less than 1/4 the length of the galea

4 Leaf-blades entire (or rarely slightly pinnatifid-lobed);
8 calyx-lobes lanceolate, acuminate, free at the apex for 3-6 mm.; corolla 20-35 mm. long; stem usually 3-7 dm. tall — 4. C. *miniata*

4 Leaf-blades lobed; bracts and their segments obtuse, truncate
8 or erose; stems not more than 5 dm. tall

6 Stem stout, hirsute; calyx-lobes oblong-lanceolate,
10 free at the apex for 2-4 mm.; corolla 20-30 mm. long — 5. C. *hispida*

6 Stem slender, loosely pilose or glabrous; calyx-lobes tri-
10 angular, united laterally nearly or quite to a common rounded apex; corolla 15-25 mm. long. — 6. C. *remota*

1. C. gibba Pennell. sp. nov. Stems several, ascending from a short rootstock 10-15 cm. tall, retrorsely pubescent; leaves ~~all borne on the stems,~~ sessile, 2-3 cm. long, pubescent, especially on the upper surface, pinnatifid with usually two pairs of slender lobes; ~~inflorescence a rather~~ dense spike borne near the tips of the stems, finely pubescent, the lowermost bracts leaflike, the others much wider, with elliptical or oval 3-ribbed body and linear lobes, all except the lowermost pale yellow towards the tips; calyx 9-10 mm. long, the sepals united laterally to beyond the middle, the free lobes linear-subulate, 2-3 mm. long; corolla 15 mm. long, much exceeding the calyx, the green, yellowish margined galea mostly equalled by or slightly exceeded by the strongly pouched whitish anterior lip, the terminal free lobes of which are 1.5-2 mm. long; capsules 6 mm. long, ovoid, dark brown; seeds 1 mm. long, dark grey.

On high ridges in the Clearwater forest.

noff → Fish Lake, 6800 ft., Epling and Houck 9563, 9810; Epling and Kempf; divide between the St. Joe and Clearwater rivers, ~~1050 m.~~ 3000 ft., collected in flower July 11, 1895, Leiberg 1142 (type, Univ. Calif. Herb., isotype, Acad. Nat. Sci. Phila. Herb.)

2. C. lutea Heller. Stems several, erect, unbranched, 20-30 cm. tall, pale and hoary, softly villous and rather viscid throughout; leaves 2-4 cm. long, the lowermost entire, the upper broader, pinnately lobed above the middle with slender spreading lobes 3-8 mm. long, villous; spikes dense, 3-6 mm. long, the bracts leaf-like but broader, and longer, the lobes obtuse, yellowish or whitish and tinged with purple, villous toward the base, pubescent at the apex; calyx villous, 2.2-2.5 cm. long, the free lobes 10-12 mm. long, yellow on the back, 22-25 mm. long, the galea 5-7 mm. long, the lip 3-5 mm. long, 3-lobed; capsule 10 mm. long. (C. villosa Rydb.; C. camporum Howells).

Open gravelly places or meadows at low elevations.

3. C. lutescens (Greenman) Rydb. Stems several, erect or ascending, 30-40 cm. tall, branching in the upper parts, rather harshly hispid-villous; leaves 3-6 cm. long, lanceolate, entire, or the lowermost entire, the upper with one or two short lateral lobes near the apex, both surfaces harshly hispid-villous; spikes dense, 4-16 cm. long, the bracts yellowish or tinged with red or purple, oblong or oval, 2 or 3 cleft half-way to the base, the lobes rather obtuse, glandular-pubescent, the margins ciliate; calyx 15-20 mm. long, thinly villous at the base, glandular above, 2-cleft half way to the base, the lobes 2-toothed at the apex, subequal to or longer than the corolla; corolla greenish (tinged with red) the galea 7-8 mm. long, glandular, the lip 2.5 mm. long, 3-lobed; capsules 8-9 mm. long. (? C. septentrionalis Lindl.).

Dry meadows in the grassland. Moscow; Potlatch; near Viola; Santa.

4. C. miniata Dougl. Stems several, erect, from a short woody caudex, glabrous or villous above, 40-100 cm. tall, unbranched except in the inflorescence; leaves 3-8 cm. long, 3-20 mm. wide, lanceolate or oblong-lanceolate, acute, rounded at the base, strongly 3-veined, puberulent, or hirsute, entire or less often with one or two lateral lobes near the apex; spikes dense, 4-8 cm. long; bracts bright red, villous and somewhat viscid, at least the uppermost 3-cleft, the lobes lanceolate, acute, commonly exceeding the calyces; calyx 16-18 mm. long, equally cleft before and behind, the lobes again cleft, lanceolate, acute or obtuse, 7-10 mm. long, reddish and villous; corolla 25-35 mm. long, green, the margins of the galea red, the galea subequal to the tube or shorter, the lower lip scarcely 1-2 mm. long, 3-lobed, green; style slightly exserted and recurved; pollen orange; capsule 16-18 mm. long. =1

Frequent or common in meadows and open places or moist slopes, mostly at lower elevations, as high as 7000 feet, however.

5. C. hispida Benth. Stems several, erect ~~from the perennial root~~, 30-50 cm. tall, more or less densely hirsute; leaves all cauline ~~borne on the stems~~, the blades sessile, 5-6 cm. long, pubescent to hirsute, lanceolate, 3-ribbed, pinnatifid with one or two pairs of slender ascending lobes; ~~inflorescence~~ spike at first dense, becoming elongated, the lower flowers then 1-2 cm. distant, the bracts leaf-like, the lower ones green, the upper shorter and relatively wider, scarlet or scarlet-red on distal halves; calyx 20-25 mm. long, cleft before and behind about 1/3 to length, the lobes again cleft, oblong-lanceolate, obtuse, 2-4 mm. long; corolla 22-27 mm. long, slightly exceeding the calyx, the green, purple-margined galea many times longer than the short rudimentary lip, the deep green lobes of which are less than 1 mm. long; capsule 12 mm. long, ellipsoid, acute, brown.

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Rocky slopes, Lewis and Nez Perces Counties. → Winchester, Constance & Rollins 1715; Hatwai Creek, Sandberg 76.

no H

6. C. remota Greene Stems several, ascending or straggling upwards ~~from the perennial root~~, 20-40 cm. tall, loosely woolly or nearly glabrous; leaves all cauline ~~borne on the stem~~, the blades sessile, 2-5 cm. long, somewhat pubescent and shortly glandular, lanceolate, 3-ribbed, pinnatifid with one or two pairs of ascending lobes; ~~inflorescence~~ spike at first dense, becoming elongated, the lower flowers then 1-2 cm. distant, the bracts leaf-like, the lower ones green, the upper shorter and relatively wider, bright scarlet towards the tips; calyces 15-20 mm. long, the sepals united from front to back 1/2-2/3 their length, but laterally nearly to the apex, the free lobes prevailingly oblong, 1~~-[illegible]~~ mm. long, sometimes less; corolla 20-25 mm. long, exceeding the calyx, the green, purple-margined galea many times longer than the short rudimentary lip, the deep green lobes of which are less than 1 mm. long; capsule 12-13 mm. long, ellipsoid, attenuate, brown; seeds 1.2 mm. long, gray. =1

Occasional in open rather dry woods at lower elevations.

noH → Lower Priest R., Epling 7205; Upper Priest Lake, Epling 7273; Hope, Epling.

## 7. Pedicularis (Tourn.) L. Louse-wort.

Perennial herbs with alternate mostly pinnatifid leaves, those at the base sometimes densely tufted. Flowers in terminal spikes or spike-like racemes. Calyx mostly 5-lobed, the lateral sepals united in pairs, the tips free, 2-lobed by complete union of the lateral sepals and disappearance of the posterior sepal. Corolla yellow, white or purple, strongly 2-lipped, the upper lip (galea) laterally compressed, either merely hooded or arched and prolonged into a beak which may curve downward between the lateral lobes of the lower lip or may be merely deflexed; lower lip 3-lobed. Stamens 4, paired, ascending under the galea or within it. Capsule laterally compressed, obliquely ovate, loculicidal. Seeds with a loose reticulate testa.

0 Calyx-lobes five, all distinct at the apex; corolla yellow, 4 greenish or purple; leaf-blades deeply pinnatifid

2 Bracts ovate or lanceolate, sometimes caudate, entire or rarely serrate, galea beakless or shortly beaked; 6 leaf-blades less than twice as long as wide, basal leaves few or none

4 Calyx-lobes glandular-pubescent, only slightly united laterally, the free lobes linear and longer than the calyx-tube, recurved; lower lip of 8 corolla ciliate; seeds with reticulations raised into longitudinal sharp lines or ridges, scarcely winged ..... 1. P. bracteosa

4 Calyx-lobes not glandular, united laterally half their length or more, the free lobes much 8 shorter than the calyx-tube; lower lip of corolla glabrous; seeds with reticulations raised into thin longitudinal wings

6 Galea 3.5 mm. broad at the apex, acute but 10 beakless; corolla purple-tinged or purple ..... 2. P. latifolia

6 Galea 5-7 mm. broad at the apex, decurved most of length, tapering to a slender beak about 10 2 mm. long; corolla yellow ..... 3. P. siifolia

2 Bracts pinnatifid, or the uppermost linear; galea with slender beak as long as the body or longer; 6 leaf-blades narrow, over thrice as long as wide, basal leaves numerous, tufted

4 Beak of galea strongly decurved between the lobes 8 of the anterior lip of the corolla; lateral calyx-lobes 1-3 mm. long

6 Corolla yellow, its lateral lobes each 3-6 mm. 10 wide, not or scarcely enclosing the bend of the galea; lateral calyx-lobes 2-3 mm. long ..... 4. P. contorta

6 Corolla purple, its lateral lobes each 6-9 mm. wide, exserted above the enclosed 10 galea; lateral calyx-lobes 1-1.5 mm. long ..... 5. P. ctenophora

4 Beak of galea upcurved and conspicuously
5 exserted; calyx-lobes .5 mm. long 6. P. groenlandica

o Calyx-lobes two, the posterior being lost and the
two sepals of each side united to a common
acuminate apex; corolla white or pink-tinged,
the galea with a slender decurved beak; leaf-
blades lanceolate, serrate 7. P. racemosa =/

1. P. bracteosa Benth. Roots fleshy, tuber-like; stems one or two, erect, 40-100 cm. tall or more, glabrous to the inflorescence, even glaucous; leaves mostly ovate in outline, the blades 8-15 cm. long, the upper sessile, the lower on petioles 2-5 cm. long, pinnate, the leaflets 2-5 cm. long, sessile, oblong, obtuse, 3-12 mm. wide, the lower remote, the upper approximate and confluent, all pinnately cut or lobed, the divisions again sharply serrulate, both surfaces glabrous; spikes dense, cylindrical, 6-30 cm. long, 2-2.5 cm. wide, the bracts 1-2 cm. long, recurved ovate to lanceolate, often attenuate at the apex, glandular, the margins entire, ciliate; calyces glandular, the tube 2-4 mm. long, the lobes attenuate, 3-8 mm. long, unequal; corolla 16-20 mm. long, dull purple or green, the galea hooded but not beaked, the lower lip ciliate on the margin; capsules 7-9 mm. long; seeds with reticulations raised into sharp lines or ridges, not winged. (P. montanensis Rydb.).

Frequent in shaded semi-mature forest usually at intermediate elevations.

2. P. latifolia Pennell. Stems 40-120 cm. tall, arising from rather fleshy tuberous roots, solitary or sometimes two, glabrous to the inflorescence; the basal leaves pinnate with petioles equal to the blades, the upper subsessile, glabrous, their blades 5-20 cm. long, nearly or quite as wide, divided nearly or quite to the midrib into 8-12 pairs of segments

which are sessile and decurrent, acute, pinnately incised, the ~~laciniae~~ divisions again sharply toothed, the teeth ending in a short mucro; spikes dense, slender, 10-40 cm. long, subtended by ovate bracts 1-2 cm. long, attenuate above the middle, with ciliate margins, entire or toothed at the apex; pedicels 1-1.5 mm. long; calyces 10-12 mm. long, glabrous or sparingly woolly, greenish, the posterior sepal shortest, projecting 3-5 mm. from the deep posterior cleft of the calyx-tube, the lateral sepals even, the free tips 2-4 mm. long, subulate-lanceolate, acute, with minutely glandular margins; corolla greenish-yellow, 15-20 mm. long, the tube and galea tinged with purple, the galea erect, arching, 3.5 mm. broad and truncate at the apex, acute but hardly produced into a beak, the lip ascending, shorter than the galea, the throat orifice open, the lobes subequal, 1.5 mm. long; filaments and anthers glabrous; capsules 9-10 mm. long with mucronate decurved tips, the chambers equal; seeds 3 mm. long, ovoid, with reticulate testa, the longitudinal reticulations raised into several low thin wings.

In shaded woods within the white pine type, usually at lower elevations.

3. P. siifolia Rydb. Roots fleshy and tuberous, the stems 1 or more, erect, glabrous to the inflorescence, 30-70 cm. tall; leaf-blades 8-15 cm. long, ovate in outline, the upper sessile, the lower on petioles 2-5 cm. long, pinnate, the leaflets sessile, lanceolate, rather acute, the lower remote, the upper approximate, ~~the margins~~ once or twice sharply serrate, the teeth ending in a sharp mucro, both surfaces glabrous; spikes dense, 5-20 cm. long, the bracts ovate, 1-2 cm. long, attenuate at the apex, mostly glabrous, the margins ciliate, sometimes woolly throughout; calyx 8-9 mm. long, glabrous, or thinly woolly, the sepals lanceolate, acuminate, subequal to or shorter than the tube; corolla greenish becoming sulphur yellow, 12-16 mm. long, the galea hooded and arched, 5-7 mm. broad at the apex and produced into an acute beak about 2 mm. long, the lip 3 mm. long, trifid, bearing two sharp ridges within; capsule 8-10 mm. long; seeds 2.5 mm. long with reticulations raised into thin longitudinal wings.

Frequent in subalpine meadows.

4. P. contorta Benth. Stems several from a very leafy often branched caudex, 20-40 cm. tall, glabrous throughout; leaves mostly basal, oblanceolate in outline, 8-15 cm. long, pinnately divided into linear segments, the longest 8-12 mm. long, 1-2 mm. wide, diminishing at the apex and base of the blade, all finely serrulate, the stem-leaves similar, smaller, sessile; flowers alternately arranged in a rather loose spike 8-12 cm. long, approximate but not crowded, each subtended by a 3-5-cleft subfoliar bract, the divisions linear, entire; calyx glabrous, 7-8 mm. long, the lateral lobes 2-3 mm. long, pubescent, with the posterior shorter; corolla yellowish, the galea strongly hooded and beaked, the beak decurved between the lobes of the lip, which are each 3-6 mm. wide; capsule 7-9 mm. long.

Frequent in subalpine meadows or along small streams at higher elevations.

5. P. ctenophora Rydb. Stems several from a very leafy, often branched caudex, 20-40 cm. tall, glabrous throughout; leaves mostly basal, oblanceolate in outline, 8-15 cm. long, pinnately divided into linear segments, the longest 6-12 mm. long, 1-2 mm. wide, diminishing at the apex and base of the blade, all finely serrulate, the stem leaves similar, ~~[illegible]~~ sessile; flowers alternately arranged in a raceme, .5-1 cm. distant, each subtended by a 3-5-cleft subfoliar bract, the divisions linear, entire; calyx glabrous, scarious in the sinuses, 7-8 mm. long, the lateral lobes 1-1.5 mm. long, pubescent within, the posterior shorter; corolla purple, the galea strongly hooded and beaked, the beak decurved between the lobes of the lip, which are 6-9 mm. wide and completely invest the beak; capsule not seen.

On very high ridges in moist soil. Bitter Root Mt., 8800 ft.; Blodgetts Peak; Coolwater Mt.

6. P. groenlandica Retz. subsp. surrecta (Benth.) Piper. Roots fleshy, the stems several from a very leafy, often branched caudex, 20-100 cm. tall, virgate, 6-20 cm. long, oblong- lanceolate in outline, pinnately divided into oblong or lanceolate lobes, the longest 8-15 mm. long, 2-5 mm. wide, once or twice sharply serrate, ~~somewhat curly on the margins,~~ the cauline leaves similar but reduced; flowers spirally crowded into a dense spike 10-30 cm. long, each subtended by a pinnately cleft subfoliar bract, or the uppermost entire; calyx 5 mm. long, thin, often purplish, the lobes subequal .5-1 mm. long; corolla purple, the galea arched and prolonged into a declined and recurving subtubular beak 15-18 mm. long, bearing two short lobes within at the base, the whole resembling an elephant's head and trunk; capsule about 9-12 mm. long; seeds 3 mm. long. ~~(P. surrecta Benth.)~~ =/

Common in subalpine meadows and along subalpine streams, frequently ~~by~~ extending as low as 3000 feet along streams in small subalpine communities.

7. P. racemosa Dougl. Stems several or numerous from a perennial crown, 40-60 cm. tall, glabrous, usually purple; leaves lanceolate, 4-8 cm. long, 4-12 mm. wide, acute, cuneate at the base or rounded to a petiole 5-6 mm. long, glabrous and veiny, the margins doubly crenate-serrate; ~~flowers in~~ short racemes, terminal or axillary, ~~or terminal panicles~~ subtended by reduced subfoliar bracts, ~~these racemes either terminal or elevated in the axils of the leaves on slender peduncles 1-8 cm. long, or the terminal racemes sometimes corymbosely panicled~~; calyx 8 mm. long, the lobes two, the posterior sepal wanting, the two remaining sepals of each side united to a common acuminate apex; corolla white, the lower lip transversely oblong, 6x12 mm., with 2 ridges in the palate, the lateral lobes much exceeding the middle lobe in size, the galea strongly arcuate and decurved, 16-18 mm. long; capsule narrowly ovate, very acute, 10-12 mm. long.

Frequent in semi-mature or young forest or in thin subalpine forests.

## 8. Gratiola (Bauhin) L.

Annual herbs with opposite leaves, the upper stem, pedicels and sepals glandular-pubescent. Flowers solitary and axillary. Corolla tube yellow, lined with purple and pubescent distally on the posterior side, the limb white; sepals 5, nearly distinct, sometimes subtended by two bractlets, the lobes spreading, white; stamens 2, included; staminodes 2 or wanting. Capsule 4-5 mm. long, exceeded by the pedicels.

0 Bractlets two, sepal-like, placed just beneath the calyx;
4 < sepals 4-5 mm. long, about equalling the capsule which is ovate in contour; seeds .4-.6 mm. long 1. G. neglecta

0 Bractlets none; sepals 6-11 mm. long, longer than the
4 globose-ovoid capsule; seeds .8-.9 mm. long 2. G. ebracteata

1. G. neglecta Torr. ~~An annual~~ herbs 15-25 cm. tall, branching from the base in vigorous forms, the branches ascending, minutely glandular; leaves sessile, 2-4 cm. long, 5-12 mm. wide, oblong-elliptical, acute, narrowed below the middle, serrate towards the apex, glabrate, the veins glandular; flowers ~~solitary in the axils~~ nearly to the base of the plant, on ascending pedicels 5-25 mm. long, subtended by two sepal-like bractlets placed at the base of the calyx and resembling the sepals; sepals 4-5 mm. long, oblong-elliptical, acute, narrowed toward the base, minutely glandular; corolla tube 8-9 mm. long, lightly curved, yellow, the limb white, 1.5-2 mm. long; capsule 5-6 mm. long, broadly ovate, acute; seeds .4-.6 mm. long.

In shallow water or muddy places along streams at low elevations.

2. G. ebracteata Benth. A low annual 2-15 cm. tall, the stems simple or branched at the base, glabrate, minutely glandular above; leaves 8-15 mm. long, 2-5 mm. wide, lanceolate, very acute, sessile, broadest at the base, subentire, glabrate; ~~flowers solitary in the axils, on~~ pedicels 5-8 mm. long, bractlets none; sepals 6-11 mm. long, oblong-lanceolate, minutely glandular; corolla yellow, the tube 5-6 mm. long; capsule subglobose, about 4 mm. in diameter; seeds .8-.9 mm. long.

In muddy places and wet soil at low elevations. Santianne Cr. bottom; Moscow.

(Bauhin)

## 9. Veronica ~~(Tourn.)~~ L.

Annual or perennial herbs with opposite leaves. Flowers in racemes or solitary in the axils. Sepals 4, rarely 5. Corolla saucer-shaped, very slightly irregular, 4-lobed, the lowermost lobe usually narrowed. Stamens 2. Stigma capitate. Capsule laterally compressed, usually notched at the apex, obovate or obcordate, loculicidal.

0 Main stem terminating in an inflorescence, ~~its~~ the leaves of the inflorescence
4 ~~bract-leaves~~ alternate

2 Plant perennial, with rootstocks; only the upper
6 leaf-axils flower-bearing so that inflorescence
is formed of definite racemes

4 Capsule longer than wide, slightly notched;
8 corolla glabrous within — 1. **V. wormskjoldii**

4 Capsule wider than long, notched one-fourth
8 length; corolla pubescent within — 2. V. serpyllifolia humifusa

2 Plant annual, fibrous-rooted, most leaf-axils
6 flower-bearing, so that inflorescence seems to
be of "axillary" flowers

4 Corolla white; capsule notched, the style .2 mm.
8 long, hidden between the capsule-lobes — 3. **V. peregrina**

4 Corolla deep violet-blue; capsule notched nearly
8 or about one-third its length, the style .6 mm.
long, reaching about to the capsule-lobes — 4. **V. arvensis**

0 Main stem never terminating in an inflorescence, the
4 leaves opposite throughout and the flowers all in
axillary racemes

2 Capsule ovoid, not or scarcely notched, equally
6 wide and long; leaf-blades lanceolate to ovate — 5. **V. americana**

2 Capsule flattened, deeply notched, much wider than
6 long; leaf-blades linear to linear-lanceolate — 6. **V. scutellata**

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1. V. wormskjoldii R. & S. An erect perennial with creeping subterranean rootstocks, the stems 15-30 cm. tall, softly villous; leaves 1.5-3.5 cm. long, ovate-lanceolate or oval to broadly ovate, mostly ovate, obtuse, rounded at the base, sessile, entire or sparingly crenate; flowers in terminal villous racemes 5-8 cm. long, the bracts lanceolate, 3-8 mm. long; calyx villous, the sepals 3.5-4 mm. long, lanceolate or oblong-oblanceolate, obtuse; corolla violet-blue, glabrous within the tube, 6-7 mm. long; capsule obovate, bluish, glandular, longer than wide, slightly notched, the persistent style less than half its length; seeds 1 mm. long, very flat, oval, concave.

Frequent in mud along subalpine streams or lakes, rarely as low as 3000 ft.

2. V. serpyllifolia (L.) var. humifusa (Dickson) Vahl. A low perennial with subterranean rootstocks, the stems ascending, 10-20 cm. tall, decumbent at the base, pubescent with spreading somewhat glandular hairs; lower leaves with obovate blades, narrowed at the base to a short petiole, the upper ovate, subsessile, all 6-15 mm. long, crenulate-serrate or subentire, glabrate; racemes 3-8 cm. long, the bracts subfoliar, pedicels slender, 3-4 mm. long, pubescent as the stems; sepals narrowly oblong-ovate, obtuse, 2-2.5 mm. long; corolla 2.5-3 mm. long, whitish or pale blue, with deeper violet-blue lines on the posterior petals; capsules 3-4 mm. wide, 2.5 mm. tall, deeply notched, the style equal to the length of the capsule.

Frequent in low muddy ground along streams at all elevations.

3. V. peregrina L. var. xalapensis (Kunth) Pennell. Erect slender annuals, tufted, 15-30 cm. tall, occasionally with one or two erect branches from near the base, glandular-pubescent; leaves linear-oblong, only the lowest opposite, with short petioles, those subtending flowers alternate, sessile, all glabrous, 1-2 cm. long, entire; ~~flowers in~~ racemes 5-15 cm. long, bracts subfoliar, reduced, sparingly glandular, longer than the flowers; sepals oblong-spatulate or oblong-lanceolate, about 4 mm. long, unequal; corolla white, 1.5 mm. long; capsule obcordate, 3 mm. in diameter, glandular, style minute, .2 mm. long; seeds 1 mm. long, oval, flattened.

In low muddy places along streams and on open slopes and fields.

4. V. arvensis L. Low inconspicuous annuals with usually erect stems 5-15 cm. tall, slender, glandular-pubescent; basal leaves opposite, ovate, 4-7 mm. long, narrowed to a short petiole, the stem leaves alternate, oblong, 5-8 mm. long, entire or remotely and sparingly toothed, sessile, all glandular-pubescent; flowers axillary, on pedicels 1.5-2.5 mm. long; sepals 3-5 mm. long, unequal, the inner pair usually somewhat shorter, oblong-elliptical, obtuse; corolla 4 mm. broad, blue, veined with deeper blue; capsules obcordate, 4 mm. broad, the slender style subequal to the lobes, .6-.7 mm. long.

Frequent in grassy meadows and along roadsides at lower elevations.

Naturalized from Europe, being introduced into Virginia prior to 1739.

5. V. americana f.) Schwein. Stems prostrate or ascending at the tip, rooting at the lower nodes, 10-40 cm. long, the upper portions glaucous; leaves about equal to the internodes, blades lanceolate to oval, 1-6 cm. long, the lower on petioles 3-4 mm. long, the upper sessile, or nearly so, all opposite, obtuse, the margins subentire or more commonly serrulate; flowers in axillary racemes 2-10 cm. long, the bracts linear-elliptical, 2-10 mm. long, pedicels filiform, recurved in flower, 5-15 mm. long; sepals ovate-lanceolate, 2-2.5 mm. long, spreading; corolla pale-blue, striate, the upper and lateral petals twice as wide as the lowermost, the uppermost largest; style decurved along the lower petal; capsule subrotund, not strongly flattened, 3-4 mm. wide, very shallowly notched, the style subequal in length; seeds .7 mm. long.

Frequent in boggy meadows or in muddy places along streams and lakes 2500-5000 feet.

6. V. scutellata L. Low creeping glabrous perennials with prostrate stems ~~rarely suberect and thinly villous~~; leaves linear-lanceolate to lanceolate, 2-6 cm. long, 3-10 mm. wide, very acute, rounded and sessile at the base, or the lowermost on short petioles, all opposite, the margins sparingly callous-denticulate; flowers in axillary slender racemes 2-10 mm. long, the bracts oblong or lanceolate, shorter than the pedicels, pedicels filiform, 6-8 mm. long; sepals 1.5 mm. long, obtuse, unequal; corolla lavender, the lobes ovate to rotund, about 2 mm. long, the lowermost longer; capsule strongly flattened, 3-3.5 mm. broad, deeply notched, broader than tall; seeds very flat, 1.5 mm. long, oval.

Frequent in boggy meadows and in muddy places along streams and lakes, mostly at lower elevations. Plants thinly villous which have been designated forma villosa (Schumacher) Pennell, occur occasionally.

## 10. Chionophila Benth.

Low perennial herbs with the aspect of Penstemon, with opposite, mostly basal leaves, the petioles of which unite to form a sheath upon the lower part of the stem. Flowers in simple one-sided racemes. Sepals 5, united 1/3 their length or more. Corolla two-lipped, the tube cylindric, gibbous at the base on the upper side. Fertile stamens 4, the fifth a glabrous staminode. Fruit a loculicidal capsule. Seeds with a loose reticulate coat.

1. C. Tweedyi (C. & R.) Henderson. Stems 10-25 cm. tall, the leaf blades 2-5.5 cm. long, oblanceolate or spatulate, attenuate towards the base, entire, glabrous; cauline leaves 8-10 mm. long, linear; flowers subsessile, few, the bracts subulate-lanceolate, 3 mm. long; calyx 4 mm. long, glandular, the sepals 2-2.5 mm. long, the lower longest, lanceolate, acute; corolla white, tinged with purple, 8-10 mm. long, the upper lip reflexed, the lower spreading, the throat nearly or quite glabrous; anthers purple, included; capsules elevated on pedicels 5-10 mm. long. (Penstemon Tweedyi Canby and Rose, Pentstemonopsis Tweedyi Rydb.).

May be found on granite slopes at high elevations in the southeastern part of our region. Bitter Root For. 8000 ft., on damp, rich ridges, Holman 524.

## 11. Penstemon (Mitchell) Schmidel. Beard-tongue

Perennial herbs, sometimes low and shrubby, mostly with one or more stems arising from a branched, leafy base. Basal leaves petioled, the cauline sessile, often clasping the stem, all opposite, sometimes in irregular whorls of 3 or 6. Flowers in racemes or more commonly in panicles, [illegible], the branches erect. Sepals 5, the margins commonly scarious. Corolla 2-lipped, the tube usually elongate-funnelform or abruptly enlarged above the middle. Stamens 4, with a fifth sterile filament bearing a beard at the apex. Stigma capitate. Capsule ovoid, 2-valved, glabrous.

0 Anthers densely woolly; capsules 11-14 mm. long
2 Stems tufted, 10-30 cm tall;
6 Leaves prevailingly less than 5 cm. long

4 Leaf-blades lanceolate or oblanceolate, mostly
8 sharply toothed, 3-5 cm. long, 2-8 mm. wide;
sepals acuminate; racemes 5-15 cm long — 1. P. fruticosus

4 Leaf-blades oval or elliptical, entire or
8 obscurely toothed, 1.5-3 cm. long, 8-12
mm. wide; sepals acute; racemes 3-5 cm long — 2. P. ellipticus

2 Subshrub 40-60 cm tall;
6 Leaves prevailingly 4-9 cm. long, lanceolate-attenuate to linear — 3. P. Lyallii

0 Anthers glabrous; capsules 3-6 mm. long

2 Anther-sacs opening throughout

4 Corolla ~~always~~ constantly pure white, 10-12 mm. long,
8 glandular puberulent within over the bases
of all the lobes; leaves sessile, ascending, sharply and coarsely toothed — 4. P. deustus

4 Corolla rarely pure white, sometimes cream-
8 colored or pale yellow or tinged with blue or
rose, commonly bluish-purple or rose-purple;
pubescent within over the bases of the lobes
of the lower lip

6 Outer surface of corollas glabrous, not at all
10 glandular; inflorescence and sepals glabrous

8 Corollas pale yellow or whitish

10 Corollas 11-15 mm. long; inflorescence
14 3.5-4 cm. broad. — 5. P. flavescens ~~densiflorus~~

10 Corollas 8-9 mm. long; inflorescence
14 scarcely 2.5 cm. broad — 6. P. confertus

8 Corollas blue or purple, very rarely with
12 pure white albino forms

10 Corollas 7-8 mm. long; — 7. P. procerus

10 Corollas 13-17 mm. long; — P. ~~[illegible]~~

8. [illegible]

6 Outer surface of corollas glandular-pubescent; inflorescence
10 and sepals glandular

8 Corollas prevailingly whitish or cream-colored, sometimes
12 tinged with rose or blue, 15-20 cm. long
9. P. attenuatus

8 Corollas prevailingly blue or purple, infrequently whitish
12 but if so usually tinged on the lobes with blue or rose

10 Peduncles bearing the axillary flower clusters ascending
14 at an angle of 45 degrees or tending to do so

12 Stems 20-40 cm. tall, the leaves mostly entire
10. P. albertinus

12 Stems 40-80 cm. tall, the leaves mostly denticulate
16
11. P. ovatus

10 Peduncles bearing the axillary flower clusters erect
14 and pressed against the stem
12. P. Eplingii

2 Anther-sacs opening only near the point of attachment, the anthers
6 horseshoe shaped

4 Leaves linear, 1-4 mm. broad; corolla lobes not ciliate; fertile
8 filaments glabrous

6 Leaves opposite, lanceolate to narrowly elliptic; corolla
10 violet-blue; sterile filament lightly bearded
13. P. diphyllus

6 Leaves ternate, linear to narrowly lanceolate; corolla
10 pale violet; sterile filament heavily bearded
14. P. triphyllus

4 Leaves oblong-lanceolate, 1-2 cm. broad; corolla lobes ciliate
8 on the margins; fertile filament hairy
15. P. venustus

1. P. *fruticosus* (Pursh) Greene. Stems ~~low~~, tufted, woody, with numerous ascending branches, 20-30 cm. tall, the branchlets glandular-puberulent; leaves *elliptic-oblanceolate or oblanceolate*, 3-5 cm. long, 2-10 mm. wide, leathery, glabrous, the margins *sharply serrate above the middle*, narrowed at the base and sessile; flowers showy, in racemes 5-15 cm. long, subtended by linear persistent bracts 5-15 mm. long; calyx 8-12 mm. long, the sepals free nearly to the base, sparingly glandular, narrowly lanceolate, acuminate, the pedicels sparingly glandular, at length 1-2 cm. long; corolla mauve, 3-4 cm. long, the tube 22-30 mm. long, 8-10 mm. wide in the throat, glabrous without, villous within on the lower surface of the throat, the upper lip 9-10 mm. long, the lower 10-11 mm. long; anther-sacs densely woolly; capsule 9-12 mm. long, very acute, tipped by the long persistent style. Four subspecies may be distinguished in our area as follows:

0 Leaf-blades linear-elliptic, 2-5 mm. wide, sharply serrate;
4 sepals 10-15 mm. long, linear-lanceolate, attenuate; corolla 35-45 mm. long. — P. f. *Scouleri*

0 Leaf-blades narrowly to widely elliptic, 4-15 mm. wide;
 4 corolla 28-40 mm. long
 2 Sepals 7-10 mm. long, acute to slightly caudate
  6 Leaf-blades coarsely serrate, relatively small — P. f. *typicus*
  6 Leaf-blades entire or slightly serrulate,
   10 relatively large — P. f. *Douglasii*
 2 Sepals 9-13 mm. long, strongly caudate; leaf-blades
  6 slightly serrate — P. f. *calycinus*

Subspecies *typicus* occurs on exposed rocky ridges, low mountains and above canyons, as along Snake River and Lolo Creek. Ssp. *Douglasii* (Hook.) Pennell and Keck is the prevalent form of mountain forests both east and west of our area but seems not to have been detected locally. Ssp. *calycinus*

Pennell and Keck occurs from the mountains north of Moscow westward into Washington. Ssp. Scouleri (Dougl.) Pennell and Keck occurs abundantly in northernmost Idaho and northeastern Oregon (Blue Mts.).

2. P. ellipticus Coult. & Fisch. A low tufted perennial, woody at the base, the branches erect or ascending, more or less herbaceous, 10-20 cm. tall, glandular-puberulent; leaves subcoriaceous, glabrous, 1.5-3 cm. long, 8-12 mm. wide, oval or ovate, the margins obscurely serrate or more often entire, the upper sessile, the lower on petioles 1-4 mm. long; flowers showy, in racemes 3-5 cm. long, subtended by subfoliar but reduced bracts; calyx 8-12 mm. long, the lobes lanceolate, acute, glandular, free nearly to the base, the pedicels at length 1-2 cm. long; corolla bluish-purple, 3-4 cm. long, the tube 22-25 mm. long, 8-10 mm. wide in the throat, glabrous without, villous within on the lower surface of the throat, the upper lip 8-10 mm. long, the lower 10-12 mm. ~~long,~~ the anther-sacs densely woolly; capsule 11-14 mm. long, acute, tipped by the long persistent style.

Frequent on ledges and rock outcrops at higher elevations.

3. P. Lyallii (Gray) Gray. A grayish showy subshrub, herbaceous above, unbranched, stems 40-60 cm. tall, puberulent; leaves sessile, narrowly lanceolate to linear, or the lowermost oblong, 3-8 cm. long, 3-14 mm. wide, very acute, rounded at the base, both surfaces sparingly puberulent, the margins subentire; flowers very showy, strongly ascending, few in terminal loose panicles with ascending branches, 10-15 cm. long, glandular, the pedicels at length 1-2 cm. long, glandular, curving upwards; sepals 9-12 mm. long, narrowly lanceolate, somewhat acuminate, glandular; corolla rose-purple, 3-4 cm. long, the tube 22-28 mm. long, 8-10 mm. wide in the throat, glabrous without, villous within the throat on the lower surface, the upper lip 9-10 mm. long, the lower 10-11 mm. long, anther-sacs densely woolly; capsules 8-12 mm. long, ovate, acuminate, glabrous. (P. linearifolius C. & F.).

Occasional on gravelly slopes or banks at various elevations.

4. P. deustus Dougl. Stems several, leafy, ascending from the branched woody rootstock, glabrous and somewhat glaucous, or minutely puberulent; early leaves oblanceolate or spatulate, attenuate to a variable petiole, stem leaves sessile or nearly so, ascending, 2.5-5 cm. long, 1-1.5 cm. broad, elliptical or oblong-lanceolate, acute, narrowed at the base, the margins sharply toothed and coarsely, the teeth spreading, 1-2 mm. tall, both surfaces glabrous; flower clusters in the axils of the upper reduced, often entire leaves, the peduncles 1-3 cm. long, erect; sepals lanceolate, 6-7 mm. long, unequal, dilated at the base, glabrous; corolla pure white, 10-12 mm. long, glandular-puberulent in the throat on the lower surface, ~~and~~ sparingly glandular on the outside; anthers purple; capsule 5-5.5 mm. long, obtuse.

Occasional on basalt outcrops above streams in the lower valleys.

5. P. flavescens Pennell sp. nov. Stems one or few, ascending from a much branched rootstock, 10-40 cm. tall, puberulent in lines or glabrous; basal leaves tufted, their blades elliptical-lanceolate or oblanceolate, acute or obtuse, entire, 4-8 cm. long, narrowed into a slender petiole, stem leaves elliptical-lanceolate or oblong, mostly obtuse, sessile and clasping, entire, 3-8 cm. long, 1-2.5 cm. wide, glabrous ~~and very smooth~~; flowers ~~displayed~~ in dense interrupted spikes 3.5-4 cm. broad, the uppermost glomerules confluent, sessile, the lowermost 3-10 cm. distant, elevated on erect glabrous peduncles 2-3 cm. long; pedicels 1-2 mm. long; sepals 5-7 mm. long, broadly ovate, obtuse or acute, with membranous white eroded margins .5-1 mm. wide, glabrous; corollas glabrous, 11-15 mm. long, pale yellow, the lobes 3-4 mm. long; capsules 5 mm. long, ovoid, acuminate, glabrous.

On moist ridges in the southern part of our region. Fish Lake, 6000 ft., Epling and Kempf; Fridays Pass, Selway Forest, Kirkwood 1641; Lolo Trail, Watson 507; Hoodoo Lake, Shattuck and Fenn; Coolwater Mt., 6500 ft., Pennell and Constance 20890 (type, Acad. Nat. Sci. Phila. Herb.).

6. P. confertus Dougl. Stems ~~Perennials growing in small clumps with~~ several slender and erect ~~stems~~ arising from the same base, 30-60 cm. tall, glabrous; blades of basal leaves 4-8 cm. long, oblanceolate or narrowly elliptical, acute, attenuate below to a slender petiole, the stem leaves distant, much reduced, in the upper parts, oblong or oblong-lanceolate, tending to be obtuse, sessile and clasping, all entire and glabrous; flowers on pedicels about 1 mm. long, in dense clusters at the tips of erect peduncles 5-20 mm. long, the uppermost clusters sessile, crowded, the lowermost 3-5 cm. distant, all forming an interrupted narrow spike commonly 10-15 cm. long, rarely as wide as 2.5 cm.; sepals 3-5 mm. long, lanceolate, to ovate, obtuse or acuminate, ~~very~~ glabrous, their margins membranous and white or tinged with rose, .5-1 mm. broad, more or less eroded; corollas whitish or pale yellow, sometimes very lightly rose-tinted in the tube, drying sulphur yellow, 8-10 mm. long, glabrous without, the throat sparingly pubescent, 3 mm. wide, the lower lip 5.5 mm. long; anthers violescent; capsules 4 mm. long.

In open gravelly places and dry slopes, usually at lower elevations; at higher elevations amongst Xerophyllum tenax.

quite

7. P. procerus Dougl. ~~Perennial herbs growing~~ stems in small clumps, ~~with~~ several, erect, slender, ~~stems~~ arising from a somewhat woody base, 30-60 cm. tall, glabrous; blades of the basal leaves 4-6 cm. long, oblanceolate or elliptical, acute, attenuate to a slender petiole, the stem leaves distant, abov much reduced ~~in the upper part~~, oblong or oblong-lanceolate, ~~tending to be obtuse~~, sessile and clasping, all entire, glabrous on both surfaces; flowers on pedicels scarcely 1 mm. long, in dense clusters ~~at the tips of erect~~ upon peduncles 5-10 mm. long, the uppermost ~~cluster~~ sessile, crowded, the lowermost 2-8 cm. distant, all tending to be globose, forming a narrow interrupted spike commonly 8-12 cm. long, about 2 cm. broad; sepals 4-5 mm. long, glabrous, lanceolate or oblong-lanceolate, mostly acuminate, their margins membranous, white or tinged with blue or purple, mostly .5 mm. broad, entire or somewhat eroded; corolla deep blue, 7-8 mm. long, ~~sometimes purplish or rose~~, tinted with blue, or rarely pure white, glabrous without, pubescent in the throat which is usually whitish or paler blue; lower lip scarcely 3 mm. long; anthers blue; capsules 3 mm. long.

Along streams but especially abundant in sloping meadows and old cutover land at lower elevations, forming there a beautiful mass of color when in full flower.

8. P. Vaseyanus Greene. ~~[illegible]~~. ~~Perennial~~ herbs with solitary ascending stems arising from a trailing often branched rootstock, 30-45 cm. tall, ~~rarely more,~~ glabrous; basal leaves tufted, their blades 4-15 cm. long, oblanceolate or narrowly elliptical, acute, narrowed to a slender petiole, the stem leaves distant, ~~not greatly reduced except in the inflorescence,~~ 5-12 cm. long, tending to oblong and obtuse, sessile and clasping, glabrous, entire, those of the inflorescence much smaller, acuminate; flowers on pedicels 3-5 mm. long, in dense clusters at the tips of erect peduncles 1-10 cm. long, the glomerules few, the upper crowded, the lower remote, forming a showy interrupted spike 5-6 cm. across; sepals 4-7 mm. long, glabrous, mostly ovate, sometimes broadly so, less often narrowly ovate or lanceolate, with membranous usually colorless, mostly entire margins scarcely .5 mm. broad, abruptly acuminate to a short herbaceous tip; corollas a beautiful violet color, somewhat more rose tinted in the throat, drying blue, 15-18 mm. long, glabrous without, the throat hairy on the lower surface; capsules 6 mm. long, broadly ovoid.

Cap.

In meadows at low elevations in the southwestern part of our region, usually associated with Polygonum bistortoides and Camassia quamash.

9. P. attenuatus Dougl. ~~Perennial~~ herbs with solitary or few ascending stems 40-60 cm. tall, arising from trailing rootstocks, glabrous below, glandular in the inflorescence; basal leaves tufted, their blades elliptical or oblanceolate, 4-6 cm. long, acute, narrowed to slender petioles, the stem leaves 5-8 cm. long, ~~gradually reduced upwards but~~ much smaller in the inflorescence, oblong or oblong-lanceolate, clasping, tending to be obtuse, those of the inflorescence acuminate, all glabrous and glaucous, the margins entire or sometimes shallowly denticulate; flowers on glandular pedicels 4-5 mm. long, in clusters on glandular, erect peduncles .5-3 cm. long, rarely more, the upper clusters sessile, thus forming interrupted spikes 10-25 cm. long, the glomerules of which are all distinct, 1-8 cm. distant; sepals 4-6 mm. long, mostly lanceolate or elliptical with narrow membranous entire margins, sometimes ovate, with broader eroded margins .5 mm. wide, always glandular; corolla whitish or pale yellow, sometimes tinged with rose of blue, 15-20 mm. long, glandular on the outer surface, the lower lip 5-6 mm. long; capsules 5-6 mm. long, broadly ovoid. (P. veronicaefolius Greene.)

n

On dry gravelly slopes usually in the open, more common in the grassland.

10. P. albertinus Greene. ~~Perennial~~ herbs with several ascending slender stems from a densely leafy crown, 20-40 cm. tall, glabrous in the lower parts, glandular above; ~~in the inflorescence;~~ basal leaf-blades elliptical or ovate, 2-5 cm. long, attenuate at the base to a slender petiole, the stem leaves oblong or oblong-lanceolate, 2-4 cm. long obtuse or acute, sessile and clasping, all glabrous and entire or denticulate at the tips; flowers in a slender lax glandular panicle, the clusters few-flowered, the lower on slender peduncles 1-2 cm. long, ascending or erect; sepals 3-4 mm. long, oval or oblong-lanceolate, rather obtuse, glandular, the margins entire, scarious; corolla 15-20 mm. long, blue, glandular without, sparingly villous in the throat on the lower surface; capsules 4 mm. long. Cap.

On exposed slopes usually at higher elevations, infrequent.

. no H Fish Lake, Epling and Houck 9836; divide betw. St. Joe and Clearwater R., Leiberg 1282; [illegible] Rose Mt., 4000 ft., Epling.

d

11. P. ovatus Dougl. ssp. pinetorum Piper ~~Perennial~~ herbs with one or more ascending stems from a leafy crown, 40-80 cm. tall, puberulent; basal leaf-blades 3-10 cm. long, oblong or oblong-lanceolate, or ovate-obtuse, rather abruptly narrowed to a petiole 3 times as long or longer, ~~even truncate;~~ the cauline narrowly ovate to oblong, sessile and clasping, acute or obtuse, 4-6 cm. long, all sparingly pubescent with rather straight short hairs, sharply dentate-serrate, the teeth 1-2 cm. tall, ~~the lower sometimes subentire;~~ flowers in an open glandular panicle, the lower lateral branches 2-10 cm. long, ascending at an angle of about 45°, the bracts mostly 2-5 mm. long, the pedicels slender, 2-5 mm. long; sepals ovate-lanceolate, 2.5-5 mm. long, glandular, spreading, narrowly scarious-margined, entire; corolla 15-20 mm. long, rich blue, less frequently reddish-purple, glandular on the outer surface, woolly on the lower lip in the throat; stamens blue, the lips lighter in shade, the sterile stamen yellow-bearded at the tip; capsules 6-8 mm. long. (P. pinetorum Piper; P. Wilcoxii Rydb.). Cap. d

On dry gravelly slopes at lower elevations, especially in rather open pine woods.

12. *P. Eplingii* Pennell *sp. nov.* Stems several, *ascending* from a branching somewhat woody base, divergent, *never strictly vertical*, glabrous in the lower parts or minutely puberulent in lines below the leaf-bases, glandular in the inflorescence, 30-90 cm. tall; basal leaves tufted, their blades elliptical or lanceolate, acute or obtuse, frequently ovate or obovate and obtuse or rounded, all narrowed to slender petioles, entire or nearly so, 4-8 cm. long; stem leaves prevailingly oblong-lanceolate and obtuse on the lower parts, lanceolate and acute or acuminate above, entire or more often tending to be shallowly denticulate, 4-12 cm. long, as much as 5 cm. broad, rounded at the base and clasping the stem, all glabrous; flowers on pedicels 1-3 mm. long, in dense clusters at the tips of glandular erect peduncles .5-5 cm. long, the glomerules for the most part distinct, 2-10 cm. distant or the lowermost as much as 15 cm., forming an interrupted spike 10-30 cm. long, *3-4.5 cm. broad*; sepals lanceolate or narrowly ovate, acute or acuminate, tending to spread, glandular, the margins hardly membranous or very narrowly so, entire; corollas 12-15 mm. long, glandular without, the tube usually purple, the lobes blue, the throat rose-purple streaked with blue, the lower lip 4-4.5 mm. long; capsules 5-6 mm. long, ovoid; seeds 1-1.3 mm. long, slightly curved, the angles sharp, not winged, acuminate, glabrous, the reticulations scarcely apparent.

15. P. venustus Dougl. Showy clumps 60-90 cm. tall, the stems ascending, glabrous; leaves ascending, 5-10 cm. long, lanceolate, sessile and rounded at the base, very acute or somewhat acuminate, sharply toothed, the teeth acuminate, tending to spread, both surfaces very smooth and glabrous; flowers in showy panicles,the branches nearly erect, the lowermost 8-10 cm. long, the uppermost 1-2 cm. long, the bracts lanceolate, passing to subulate above; sepals ovate-acuminate or lanceolate, 3.5-4.5 mm. long, with membranous margins in the lower parts, glabrous, and somewhat glandular towards the tips; corollas 25-30 mm. long, a beautiful even violet, glabrous, the tubes 16-20 mm. long, rather abruptly dilated; upper lips erect, 7-8 mm. tall, the lower spreading, 10-11 mm. long, the lobes all rounded ciliate on the margins; filaments sparingly hairy towards the apex, the anthers pale violet, as in P. triphyllus, the line of dehiscence eroded and sometimes thinly hairy, the sterile stamen very thinly bearded; capsules narrowly ovoid, 6-7 mm. long.

On the slopes of the Clearwater and tributary canyons. Little Bear Canyon; Moscow Mt.

## 12. Scrophularia (Bauhin) L.

Perennial herbs with opposite petioled leaves. Flowers small and inconspicuous in terminal panicles. Calyx 5-cleft. Corolla globose, 5-lobed, the posterior 4 erect, the anterior lobe reflexed, or spreading. Fertile stamens 4, the fifth a scale-like staminode. Fruit a septicidal capsule.

1. S. lanceolata Pursh. Stems several or solitary, erect or ascending, 1 m or more tall, puberulent, 4-angled, the angles margined; leaves thin and green, the blades 6-12 cm. long, ovate, obtuse or acute, rounded truncate or even subcordate at the base, sharply serrate, the teeth ovate, mucronate, 2-4 mm. tall, both surfaces puberulent, the petioles 1-2 cm. long; ~~flowers in~~ cymose panicles 30-60 cm. long or more, glandular-pubescent, the bracts subulate; calyx campanulate, the lobes triangular-ovate to hemispherical, obtuse, 1.5 mm. long, equal to the tube; corolla 10-11 mm. long, erect, green, margined with red, or reddish, the upper lip subrotund, cut to the middle, the lateral segments 1.5 mm. tall, 2.5-3 mm. wide, erect, the lower lobe rounded, reflexed and appressed, 2 mm. long; stamens and style erect, equal to the lateral lobes, the filaments minutely glandular, anthers yellow; capsule 7 mm. long. (S. nodosa occidentalis Rydb., S. serrata Rydb.).

Infrequent at the margins of woods or along small streams at elevations of 2500-6000 ft. Second synonym based on a Sandberg collection from Granite, Bonner Co.

## 13. Collinsia Nutt.

Low annual herbs with opposite or whorled leaves. Flowers solitary or few in the upper axils. Calyx-lobes 5. Corolla 2-lipped, the tube saccate at the base on the upper side, the lower lip 3-lobed, the middle lobe compressed-saccate, containing the stamens and style. Fertile stamens 4, the fifth a gland-like staminodium. Fruit a septicidal capsule.

1. C. parviflora ~~Nutt.~~ Dougl. A slender annual diffusely branching at the base, the stems finely glandular-puberulent, more or less decumbent, 10-30 cm. long; leaves few, the lowermost spatulate or oblanceolate, .5-1.5 cm. long, the upper whorled, lanceolate or lanceolate-oblong, acute, 1-3 cm. long, all glabrous, entire, on petioles 1-2 mm. long; ~~flowers several or solitary in the upper axils, the~~ pedicels filiform, ascending, deflexed in fruit, .5-1 cm. long; calyx glandular-puberulent, 3-4 mm. long, the tube subscarious, the lobes subequal to the tube, subulate, acute; corolla 4-7 mm. long, the tube laterally compressed, 2-3 mm. long, gibbous within the calyx, declined, lobes of the upper lip truncate-obovate, white, tinged with blue, 2 mm. long, the lateral lobes oblong-spatulate, 3 mm. long, blue, the middle lobe half as long; ~~compressed-saccate, enclosing the somewhat shorter stamens and style;~~ capsule 2.5-3.5 mm. long.

Frequent at all elevations on open hillsides, along trails and in gravelly meadows.

## 14. Mimulus L. Monkey flower.

Annual or perennial herbs with opposite usually dentate leaves. Flowers perfect, axillary or in racemes or panicles. Calyx distinctly 5-angled, the lobes mostly unequal, the orifice consequently more or less oblique. Corolla yellow or purple, two-lipped, the throat either open or closed, bearing two ridges on the lower surface within. Stamens 4. Style glabrous, the stigma two-lobed. Fruit a loculicidal capsule.

0 Corolla yellow; anthers glabrous or sparsely pilose; dehiscence 4 of capsule not cleaving the septum; seeds ellipsoid-orbicular =1

2 Corolla not obviously two-lipped, the throat open

4 Corolla 16-21 mm. long, deep-yellow, somewhat 8 streaked with purple within at least on the anterior lobes — 1. M. moschatus

4 Corolla 8-11 mm. long, pale-yellow, sometimes 8 purple-spotted within anteriorly but not streaked

6 Stems and pedicels villous with viscid 10 hairs; corolla tube 10 mm. long — 2. M. floribundus

6 Stems and pedicels puberulent; corolla 10 tube 7 mm. long — 3. M. breviflorus

2 Corolla strongly two-lipped, the throat nearly 6 or quite closed by the palate-like lower lip

4 Flowers usually numerous in elongate racemes; 8 pedicels usually shorter than the corollas — 4. M. guttatus

4 Flowers commonly three to five, rarely seven; 8 pedicels usually longer than the corollas — 5. M. Tilingi

0 Corolla purple-red; anthers densely white-hispid; dehiscence 4 of capsule cleaving the septum distally; seeds oblong-lanceolate =1

2 Corolla ~~large,~~ 40-45 mm. long, deciduous; mature capsule 6 enclosed within the calyx-tube; pedicels longer than the calyces — 6. M. Lewisii

2 Corolla ~~small,~~ 12-15 mm. long, shriveling and semi-persistent; 6 mature capsule exserted beyond the calyx; pedicels shorter than calyces — 7. M. clivicola

1. M. moschatus Dougl. Leaf-blade ovate-lanceolate, 3-8 cm. long, acute, rounded at the base, the margin denticulate, the teeth remote, upper surface obscurely appressed silky, the lower glutinous-villous, petioles 1-5 mm. long; flowers solitary in the axils on pedicels 1.5-2 cm. long, glandular-villous; calyx 12-14 mm. long, campanulate-tubular, strongly angled, glandular, the lobes unequal, lanceolate, 5-7 mm. long; corolla yellow, the throat spotted with red, open, gathered into three folds on the lower surface, the tube 12-20 mm. long, gradually dilated upwards, the lobes subequal, spreading, ~~subrotund at the laterals,~~ veined with purple, the palate pilose; stamens about 1 cm. long, adnate at the base to the tube; style 12-13 mm. long, the stigmas 1.5 mm. broad, rhombic.

A low sticky plant with prostrate branches or supported by other herbage, about seep~~s~~age and springy spots and quiet coves of streams.

2. M. floribundus Lindl. A low annual with weak stems, more or less prostrate, villous with viscid hairs; leaves ovate, the blades 5-20 mm. long or more, obtuse, frequently cordate at the base, both surfaces viscid-villous, the margin remotely denticulate, the petioles shorter than the blades, slender; flowers few, axillary, the pedicels 4-8 mm. long; calyx 6 mm. long, increasing to 8-9 mm. in fruit, the mouth oblique, the lobes 2-3 mm. long; corolla pale yellow, the tube 10 mm. long, the limb spreading; capsule 5 mm. long, the seeds subglobose.

In moist soil along streams. Orogrande Cr.; Spokane Bridge.

3. M. breviflorus Piper. A low erect annual 2-8 (or 15) cm. tall, gregarious, the stems filiform, glandular-puberulent; leaves thin, 3-10 mm. long, broadly ovate, on subequal filiform petioles, both surfaces glabrate, the margins subentire; flowers axillary on filiform pedicels

8-10 mm. long, increasing in fruit; calyces 4-6 mm. long, increasing to 6-7 mm. in fruit, the lobes subequal, .8-1.1 mm. long; corolla orange-yellow, the tube 7 mm. long, the upper lobes of the limb scarcely 1 mm. long, the lower somewhat longer; stamens in 2 pairs, 2 mm. long; capsule 4-5 mm. long.

Usually in moist crevices of basalt rocks near streams.

4. M. guttatus Fischer. Perennial herb of diverse sizes, 30-60 cm. tall or less, the rootstocks creeping; stems glabrous, glaucous, hollow, almost succulent; leaf blades 1-6 cm. long, oval, broadly ovate or subrotund, glabrous, the veins prominent, the margin denticulate, those in the upper axils sessile, the lower on petioles 1-4 cm. long; flowers usually numerous in elongate terminal racemes, showy, the bracts reduced, connate, subentire, pedicels glandular, 1-2 cm. long, as much as 5 cm. in fruit; calyx 8-13 mm. long, glandular, somewhat longer in age and inflated; corolla orange-yellow, the tube reddish-spotted within, 14-20 mm. long, with 3 folds on the lower side within, the throat closed, the upper lip 2-lobed, 1~~0~~8-12 mm. long, the lower 18-20 mm. long, the middle lobe nearly twice the width of the laterals, often retuse, the palate hairy; stamens in two pairs, included within the tube; stigmas 2 mm. broad; capsule 6-8 mm. long, the seeds oval.

Common in moist meadows or swampy places at lower elevations; depauperate individuals are difficult to distinguish from the following species.

5. M. Tilingi Regel. Stems erect but weak, hollow, glabrous or sparingly hirtellous with minute spreading hairs, 10-90 cm. tall, commonly 40-60 cm.; ~~the internodes as much as 2-3 times longer~~; leaves 2-4 cm. long, on petioles .5-2 cm. long, or the uppermost sessile, broadly ovate, or even suborbicular, very obtuse, rounded at the base, the veins 5-7, arising

~~arising~~ from near the base, the margins sharply toothed, the teeth 1-1.5 mm. tall, both surfaces glabrate, or the upper minutely hirtellous, the lower on the veins alone; flowers few, in the upper axils, commonly 3-5, rarely 7, borne on slender pedicels 3-6 cm. long, rarely less, prevailingly hirtellous with minute spreading hairs; calyx mostly top-shaped, 10-15 mm. long, glabrous or minutely hirtellous, strongly angled, oblique at the orifice, the teeth deltoid, rather obtuse, 1.5-4 mm. long, unequal; corolla golden yellow, the palate hairy, with 3 folds below, closing the throat, lightly flecked with purple, the tube 14-22 mm. long, the upper lip 8-12 mm. long, the lower 15-20 mm. long, 20-30 mm. broad; mature calyx ovoid, strongly inflated, 20 mm. long, the capsule oblong, 10 mm. long.

Frequent in very moist meadows within the white pine type, usually shaded and more or less supported by other rank herbage. mostly at higher elevations,

**6. M. Lewisii** Pursh. A handsome perennial with slender rootstocks, the stems 20-40 cm. tall, reclining or even prostrate, glandular-pubescent; leaves sessile, 3-4 cm. long, elliptical, 5-7-veined from the base, acute, narrowed at the base, glabrous or sparingly puberulent, the margin sharply but remotely serrate-dentate; flowers few, in the upper axils on glandular pedicels 2.5-5 cm. long; calyx 1.5-2 cm. long, tubular, angled, the teeth subequal, ovate, acuminate, 4-5 mm. long; corolla 3-4 cm. long, rose-purple, the tube whitish, flecked with purple, the ridges of the palate yellow, sparsely pilose, the lobes subequal, 1 cm. long, oblong, blunt; stamens and style included in the tube.

In moist ground along subalpine streams.

7. M. clivicola Greenm. A low annual with small roots, the stems 5-7 cm. tall, erect, glandular-pubescent; leaves slightly petioled, 1-1.5 cm. long, elliptic-oval, 3-5-veined from the base, obtuse, narrowed at the base, glandular-pubescent, the margin sinuately dentate; flowers in most axils on glandular-pubescent pedicels 2-5 mm. long; calyx 7-8 mm. long, tubular, strongly angled, the teeth subequal (posterior slightly longer), ovate, acute, 1.5 mm. long; corolla 12-15 mm. long, purple, the tube paler, probably purple-spotted, the ridges of the palate short-pubescent, the lobes subequal, 4-5 mm. long, rounded; stamens and style included in the tube.

Weissners Peak, Sandberg 586 (type); along Middle Fork of Clearwater River, 3 miles below Lowell, Constance & Rollins 1628.

## 15. Melampyrum (Bauhin) ~~(Tournef.)~~ L.

Low annual herbs with slender leafy stems, the leaves opposite. Flowers solitary in the upper axils. Calyx 4-toothed. Corolla 2-lipped, the upper lip compressed, the lower 3-lobed. Stamens 4, paired, ascending under the upper lip. Capsule compressed, 2-3 seeded, obliquely ovate, opening chiefly by 1 suture.

1. M. lineare Desr. ~~var. americanum (Michx.) Beauverd~~ Cow-Wheat. Stems 15-30 cm. tall, glandular-puberulent above, branching above the middle, the branches ascending; leaves 3-5 cm. long, lanceolate, lightly acuminate, the lower narrowed at the base to a petiole 1-2 mm. long, entire, the upper leaves cuneate at the base, bearing one or two short triangular teeth at the broadest part, all glabrous; ~~flowers solitary in the axils on~~ pedicels 2-3 mm. long; sepals 1.5-2 mm. long, subulate, increasing somewhat in fruit; corolla whitish, 7-8 mm. long; capsules 7-8 mm. long; seeds 4 mm. long, black and shining, ~~with~~ bearing a conspicuous caruncle.

In moist shaded places; infrequent.

## Lentibulariaceae. Bladderwort Family.

Ours aquatic plants with finely dissected leaves bearing small urn-shaped insectivorous bladders, the mouths of which are closed by tiny lids. Flowers perfect, irregular, in erect emersed racemes. Calyx of 2 or 5 sepals. Corolla strongly 2-lipped, the tube spurred or saccate. Stamens 2, adnate to the corolla tube on the upper side. Anthers 1-chambered. Pistil solitary; ovary superior, the placenta central. Fruit an irregularly dehiscent capsule.

### Utricularia L. Bladderwort.

Characters of the family. Sepals two. Corolla throat closed by the palate, the lower lip with a spur at the base.

1. U. vulgaris L. Leaves dissected into thread-like segments, divided to the base into two principal segments, the segments again irregularly 2-3 times pinnate; bladders 1 mm. in diameter or less; racemes 15-20 cm. long, each subtended by a sheathing membranous bract 3-4 mm. long; pedicels 10-15 mm. long; sepals 2, ovate, 3-4 mm. long, the lower somewhat larger; corolla yellow, strongly 2-lipped, the upper lip nearly plane, erect, 12 mm. long, 8-9 mm. wide, lower lip lined with brown, the margin 3-4 mm. wide, spur stout, curving, 7-9 mm. long; stamens thickened, connivent.

Aquatic plants rooting in mud, the stems floating, frequent in marshes or lagoons of lakes. Lake Coeur d'Alene; Pend Oreille R.; Santa.

## Orobanchaceae.

[illegible] without chlorophyll, their leaves scale-like, alternate. Flowers perfect. Sepals 4 or 5. Corolla tubular, bilabiate, 5-lobed, withering-persistent. Stamens 4, in pairs, their filaments adnate to the tube of the corolla; anthers mostly 2-celled. Ovary superior, 1-chambered; style 1. Fruit a 2-4-valved capsule, each valve bearing 1 or 2 placentae. Seeds numerous, minute.

### Orobanche (Tourn.) L. Cancer-root.

[illegible]-colored, or yellowish [illegible] with more or less tuberous subterranean [illegible]. Flowers solitary or in racemes. Sepals 5. Corolla tubular, 2-lipped, the throat open. Capsule 1-chambered, 2-valved.

Stems mostly or wholly subterranean
  Flowers solitary — 1. O. uniflora
  Flowers several — 2. O. fasciculata
Stems 10-15 cm. tall or more — 3. O. pinorum

1. O. uniflora var. sedi (Suksd.) Achey  Flowers solitary on erect glandular peduncles [illegible] cm. tall, commonly several from each cluster; calyx 7-10 mm. long, the lobes nearly twice as long as the tube, subulate, spreading, acute; corolla sordid-white with two yellow ridges in the throat, 1.5-2 cm. long, tubular, slightly curved, the upper lip 5 mm. long, bifid half its length, the lower lip 4 mm. long, equally lobed to the base; stamens and style included, the latter with 2-lobed stigma, anthers glabrous; capsule ovoid, 7-[illegible] mm. long. (Aphyllon sedi Suksd.; O. sedi (Suksd.) Fern.).

Occasional but inconspicuous in the duff of fairly mature woods, often [illegible] Sedum. Purple-flowered, usually pubescent-anthered [illegible] corollas [illegible] long, are var. purpurea [illegible], [illegible].

[illegible]. O. fasciculata Nutt. Flowers several, erect, [illegible], subtended by ovate or lanceolate bracts [illegible] mm. long, on stems 10-20 cm. tall, from chiefly underground branching stems; pedicels glandular, 3-10 cm. long; calyx 8-15 mm. long, glandular-pubescent, its lobes as long as the tube to nearly twice as long, mostly triangular-lanceolate, acuminate; corolla purplish, curving slightly, 2.5-3 cm., its lobes 3-4 mm. long, rounded or obtuse; capsules ovoid, [illegible]-10 mm. long.

Parasitic especially on Artemesia and Eriogonum; a widespread species [illegible] known from Lake Coeur d'Alene, Heller 308. Achey (1933) considers this coll. to be var. lutea (Parry) Achey, with usually pubescent stamens and the throat of corolla broader; ~~since~~ the variety is not geographically segregated. ~~lacks geographic differentiation Beck (1[illegible]0) and treatment of Aphyllon luteum Parry be forma~~ seems advisable.

[illegible]. O. pinorum Geyer. Erect, much-branched, [illegible] cm. tall, glandular-villous, viscid; scales [illegible] mm. long; flowers numerous, on pedicels 1 mm. long; calyces [illegible] mm. long, campanulate, the lobes lanceolate, acuminate, somewhat longer than the tube; corolla yellowish, glandular, [illegible] mm. long, somewhat arched, the tube abruptly dilated in the upper two thirds, the lobes 3-4 mm. long, the upper bifid, the lower 3-lobed, the lobes lanceolate, mostly acute; capsules 7 mm. long; seeds ovoid, .5 mm. long, strongly reticulate, the reticulations sharply raised. (Myzorrhiza pinorum Rydb.).

Type collected by Geyer on "top of [illegible] hills [illegible] near St. Joseph". Apparently infrequent over the entire range, known to us only from [illegible], [illegible], parasitic on roots of Douglas fir, Epling & Houck 10[illegible]8; [illegible] Hill, [illegible] 176.

## Verbenaceae. Verbena Family.

Herbs or shrubs with opposite leaves without stipules. Flowers perfect, more or less irregular but not strongly 2-lipped, borne in slender terminal spikes. Calyx [illegible]-lobed or toothed. Corolla tubular with a usually 5-lobed spreading limb. Stamens 4, paired. Ovary superior, not lobed, 2-4-chambered, separating finally into 2-4 nutlets (in our species).

### Verbena (Tourn.) L. Verbena.

Ours perennial herbs with opposite leaves and inconspicuous flowers in terminal slender spikes. Calyx narrow-tubular, 5-toothed. Corolla irregular, weakly 2-lipped, 5-lobed, the limb short. Ovary 4-chambered. Fruit of 4 equal nutlets enclosed by the persistent calyx.

o Calyces 4 mm. long; corolla 9-10 mm. long, blue. 1. V. hastata

o Calyces [illegible] mm. long; corolla 4 mm. long, pink 2. V. bracteata

1. V. hastata L. Blue Vervain. Herbs with several ~~rather~~ 4-angled ascending stems [illegible] cm. tall, pubescent with short spreading hairs; leaves rather crowded, the blades [illegible]-8 cm. long, mostly ovate, or the lower obovate, blunt at the apex, narrowed at the base to a short petiole 3-5 mm. long, the margins sharply toothed, both surfaces harshly pubescent with appressed hairs; flowers sessile, in several narrowly cylindrical compact spikes [illegible] cm. long, less than 1 cm. thick; bracts 6-7 mm. long, lanceolate, acuminate, appressed; calyces 4 mm. long, the lobes deltoid, 1 mm. long; corolla violet-blue, 9-10 mm. long, the limb 3 mm. long.

An occasional weed in waste places.

2. V. bracteata Lag. & Rodr. Herbs with several slender prostrate or procumbent branches sparsely hirsute with spreading hairs; lower leaves on petioles as long as the blades, the upper nearly sessile, all deeply incised or pinnatifid, the blades 2-5 cm. long, coarsely toothed, hispid on both surfaces with spreading hairs; crowded spikes 5-15 cm. long; bracts linear-lanceolate, spreading, 6-8 mm. long, twice as long as the calyces; calyces sessile, 2.5 mm. long, the teeth scarcely 1 mm. long; corolla pink 3-4 mm. long, the limb 1 mm.; nutlets 2 mm. long, distending the calyx, reticulate-veined on the back. (V. bracteosa Michx.).

Frequent along rights of way.

## Labiatae. Mint Family.

Annual or perennial herbs or undershrubs with opposite simple leaves without stipules and with mint-scented herbage. Flowers perfect, in racemes or spikes or solitary in the axils or often in axillary whorls, the uppermost forming an interrupted spike. Calyx regularly 5-(4) toothed or lobed or 2-lipped, the upper lip 3-toothed, the lower 2-toothed or the lips entire, the upper then bearing a marked protuberance. Corolla 5-(4) lobed, nearly regular to more often strongly 2-lipped. Stamens 2 or 4 in 2 pairs, often unlike, the one pair frequently sterile. Ovary superior, deeply 4-lobed, forming 4 1-seeded nutlets, ~~appearing free at maturity~~; style 1, bifid at the summit, ~~sometimes produced downward as an elongated conical structure (gynobase) persistent between the mature nutlets. The stems are frequently 4-angled~~.

0 Calyx 2-lipped, the lips rounded, entire, the upper bearing
4 an erect protuberance which increases in fruit 1. **Scutellaria**

0 Calyx equally 5-lobed or 2-lipped but the lips not
4 entire, not bearing a protuberance

2 Flowers solitary in the axils 2. **Satureja**

2 Flowers in spikes or axillary clusters, not
6 solitary

4 Anther bearing stamens, 2

6 Flowers in dense hemispherical heads;
10 corollas 3-4 cm. long 3. **Monarda**

6 Flowers in small compact axillary
10 clusters; corollas 2-3 mm. long 4. **Lycopus**

4 Anther bearing stamens 4

6 Calyx teeth 10-12, hooked at the apex 5. **Marrubium**

6 Calyx teeth 5, sometimes spinose but not
10 hooked

8 Leaves entire

10 Flowers in dense hemispherical
14 heads 6. **Monardella**

10 Flowers in axillary clusters or
14 cylindrical spikes

12 Corolla strongly hooded, the
16 upper lip entire, containing
the stamens; upper lip of
calyx truncate 7. **Prunella**

12 Corolla 5-lobed, the stamens
16 exserted between the upper
lobes; upper lip of calyx
not truncate 8. **Trichostema**

8 Leaves serrate

10 Corolla 3-6 mm. long, scarcely 2-
14 lipped, appearing equally 4-lobed 9. Mentha

10 Corolla 8-15 mm. long, strongly
14 2-lipped, the upper lip erect, often concave, the lower spreading, 3-lobed

12 Stamens exserted 4-6 mm. 10. Agastache

12 Stamens included under the upper
16 lip or nearly so

Calyx upper middle lobe
14 ~~Middle upper lobe of calyx~~ ovate,
18 2.5-3 mm. broad, about twice as large as the lower lobes; bracts spinose on the margins 11. Moldavica

14 Calyx lobes subequal; bracts
18 not spinose

16 Plants glabrous; calyx teeth
20 1-1.5 mm. long 12. Dracocephalum

16 Plants hirsute or tomentose;
20 calyx teeth 2-4 mm. long

18 Anthers ciliate; middle lobe
22 of lower lip deeply notched and strongly narrowed at the base, 3 mm. broad 13. Lamium

18 Anthers glabrous; middle lobe
22 of lower lip entire or eroded but not deeply notched, 4-5 mm. broad

20 Lower lip of corolla with a
24 dense hairy tuft; leaves ovate, softly tomentose 14. Nepeta

20 Lower lip of corolla glabrous;
24 leaves oblong or oblong-lanceolate, hirsute 15. Stachys

## 1. Scutellaria (Rivin.) L. Skullcap.

~~Annual or~~ Ours perennial herbs with entire or serrate leaves. Flowers in short axillary racemes, or most often solitary in the axils. Calyx campanulate, strongly two-lipped, the lips rounded, entire, falling apart at maturity, the upper bearing an erect protuberance (scutellum) which enlarges in fruit. Corolla strongly funnelform, dilated in the throat, the limb short, 2-lipped, the upper lip arching, the lower deflexed, 3-lobed. Stamens 4; anthers of the lower pair 1-chambered. Nutlets attached to a conical gynobase, roughened.

O Flowers solitary in the axils
2 Leaves mostly entire; corolla ~~violaceous,~~ , narrowed at the base
6 2.5-3 cm. long — 1. S. angustifolia
2 Leaves mostly serrate; corolla ~~blue,~~ , truncate or rounded at the base
6 16-20 mm. long — 2. S. galericulata ~~epilobiifolia~~
O Flowers in short axillary racemes — 3. S. lateriflora

**1. S. angustifolia Pursh.** Rootstocks slender, creeping, producing thickened underground tuber-like stolons; stems 15-30 cm. tall, slender, usually with 2 or 3 shorter branches, or branched from the base, puberulent with minute curved hairs; leaf-blades 1.5-3 cm. long, the lowermost frequently ovate or rotund, the remainder oblong or oblong-lanceolate, very obtuse, glabrate, entire, on petioles 1-3 mm. long; flowers axillary on slender pedicels 3-6 mm. long; calyx 5 mm. long at anthesis, hirtellous, the scutellum 1.5 mm. tall, fruiting calyx 6 mm. long, the scutellum 3-3.5 mm. tall; corolla a beautiful violet-blue, puberulent, 2.5-3 cm. long, the tube abruptly dilated above the middle, the throat 7-10 mm. wide, the lips 7-8 mm. long, subequal; nutlets 1 mm. in diameter, black, warty with rather acute warts. =1

Rocky places along streams or in moist rocky ground. The type collection made by Lewis ~~opp. present~~ near Kamiah, ~~Ida.~~

**2. S. galericulata L. ~~epilobiifolia Hamilt.~~** Perennial with slender, creeping rootstocks, the stems erect, 15-60 cm. tall, slender, mostly unbranched, the angles hirtellous; leaves soft, often with a purplish tinge, 3-5 cm. long, 10-25 mm. broad, oblong-lanceolate to ovate-oblong, mostly acute, lightly truncate or cordate at the base, the lower surface softly pubescent, the margins serrate, borne on petioles 1-4 mm. long; flowers solitary in the upper axils, often displayed on one side of the axis; calyces 4 mm. long at anthesis, puberulent, the scutellum 1 mm. tall, fruiting calyx 6 mm. long, the scutellum 3 mm. tall; corolla blue, the palate whitish, pubescent, 16-18 mm. long, arcuate-ascending, the upper lip and laterals of the lower lip compressed, 2-2.5 mm. long, the middle lobe spreading, 7-8 mm. broad, undulate; nutlets 1.8 mm., unevenly papillose with rounded papillae.

In boggy ground or swamps at low elevations.

3. S. lateriflora L. Perennial with slender rootstocks, producing stolons at the lowermost nodes; stems 20-30 cm. tall, usually branching above, hirtellous on the margins; leaf-blades 2-5 cm. long, ovate, subacute, rounded or subcordate at the base, nearly glabrous, the margins serrate; petioles .5-2 cm. long, slender; flowers disposed in axillary racemes 2-3 cm. long, subtended by small subfoliar bracts; calyces 2 mm. long at anthesis, appressed-puberulent, increasing to 4 mm. in fruit, the scutellum 1.5 mm. tall; corolla pale blue or bluish, 5-6 mm. long, the lower lip 2 mm. long, nutlets rather sharply tuberculate.

Frequent along streams and lakes and in boggy ground.

## 2, Satureja (Tourn.) L.

Trailing perennial herbs with crenate-dentate leaves. Flowers solitary in the axils. Calyx tubular, subequally 5-toothed, the teeth triangular. Corolla tubular, 2-lipped, the upper lip notched, the lower 3-lobed. Stamens 4, the pair inserted below the lower lip longer. Nutlets smooth.

=/

1. S. Douglasii (Benth.) Briq. Tea-vine. Stems from a short crown, hispidulous; leaves 1.5-2.5 cm. long, broadly ovate, obtuse or rounded at the apex, cordate or truncate at the base, coarsely crenate-dentate, both surfaces glabrous, the petioles 3-4 mm. long; flowers on hispidulous peduncles 12-15 mm. long, subtended by a pair of small subulate bractlets; calyces 4.5 mm. long, strictly tubular, hispidulous, lightly 2-lipped, the teeth acute, 1 mm. long or less; corolla white, 7-10mm. long, the upper lip often tinged with lavender, 2.5 mm. long, the lobes of lower lip oblong, 1.5 mm. long; stamens included under the upper lip; nutlets smooth. (Micromeria chamissonis Greene; M. Douglasii Benth.).

Frequent in dry woods at lower elevations.

## 3. Monarda L. Horsemint.

Perennial herbs with several or numerous erect stems from creeping rootstocks; leaves subentire. Flowers in terminal showy capitate glomerules subtended by subfoliar spreading bracts. Calyx tubular, shortly 5-toothed, the teeth subulate. The corolla rose-purple, trumpet-shaped, strongly 2-lipped, the upper lip entire, narrowly triangular, the lower 3-lobed. Stamens 2. Nutlets smooth.

*1. M.* menthaefolia Grah. ~~fistulosa var. menthaefolia (Grah.) Fern.~~ Stems 50-70 cm. tall, branching, purplish, pubescent above; leaf-blades ovate to oblong-lanceolate, 3-5 cm. long, shortly acuminate, rounded or subcordate at the base, the margins ~~subentire~~ remotely and shallowly denticulate, both surfaces softly pubescent with short curling hairs, petioles 3-12 mm. long; glomerules hemispheric, 5-6 cm. broad in full flower, the bracts subfoliar, 1-2 cm. long; calyces 8-11 mm. long, puberulent and sprinkled with sessile glands, the orifice hirsute, the teeth ~~subulate~~ scarcely 1 mm. long; corolla ~~soft rose-purple~~ pubescent, 3-3.5 cm. long, the upper lip 8-13 mm. long, acute, the lower oblong, subequal or somewhat longer, 3-lobed at the tip; stamens ascendant under the galea; nutlets smooth, 1.6 mm. long.

In rocky places near Moyie Springs, *Epling 10421*; Hope, *Epling*; Bonners Ferry, *Christ 827*. Almost certainly introduced into our region, spreading westward along rights of way.

## 4. Lycopus (Tourn.) L. Water Horehound.

Perennial herbs with horizontal rootstocks or arising from small horizontal tubers; leaves coarsely toothed or incised. Flowers in compact axillary glomerules, small. Calyx campanulate, 5-lobed or toothed. Corolla campanulate or tubular-funnelform appearing nearly equally 4-lobed, the uppermost lobe somewhat larger. Fertile stamens 2, the filaments of the posterior pair frequently present, without anthers. Nutlets flattened triangular, with a horseshoe-shaped callosity marginally on the back, glandular on the inner face, truncate at the apex and even or somewhat toothed.

o Plants with creeping horizontal rootstocks; calyx-
4 teeth acuminate, subspinose, exceeding the mature
nutlets 1. L. americanus

o Plants propagating by small horizontal tubers which
are found at the ends of slenderstolons; calyx
4 teeth acute or obtuse, equalling or shorter than
the mature nutlets. 2. L. uniflorus

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1. L. americanus Muhl. Stems from rootstocks, without stolons, virgate and branching above, 20-50 cm. tall, glabrate, the angles very acute, marginate; leaves 3-5 cm. long, 10-15 mm. wide, elliptical-lanceolate, the lowermost pinnatifid, the upper laciniate or sharply toothed, very acute, narrowed at the base to indefinite petioles or subsessile, both surfaces glabrous or the veins beneath hirtellous; glomerules 5-7 mm. wide; calyces 2-2.5 mm. long, the teeth triangular-acuminate, subspinose at the tip, exceeding the nutlets at maturity; corolla white, or rose-tinted, 2-2.5 mm. long, scarcely exserted from the calyx-teeth, the tube closed by a hairy ring at the base of the stamens; nutlets 1 mm. long.

Frequent in boggy ground and along stream and lake shores.

2. L. uniflorus Michx. Stems simple or branched, 15-30 cm. tall, very leafy, puberulent; leaf-blades narrowly rhomboid-elliptical, 2.5-7 cm. long, 1-2.5 cm. wide, widest near the middle, tapering and acute at both ends, sharply serrate, with indefinite petioles or subsessile, both surfaces glabrous, light green, the lower paler; glomerules 5-8 mm. wide; calyces 1.5-2 mm. long, the teeth obtuse or acute, triangular; corolla white or rose-purple, scarcely 3 mm. long, the lobes rounded, scarcely 1 mm. long, the tube hairy within between the filaments, the anthers purple, the ovary bright green; nutlets 1.3 mm. long, exceeding the calyces at maturity. ( L. communis Bickn.).

Frequent in boggy ground and along streams or lake shores. Perennial from filiform stolons from the lower axils which eventually form small horizontal tubers from which in turn new stems arise.

## 5 Marrubium L. Horehound.

Ours perennial herbs or undershrubs with numerous stems ascending from a woody crown; leaves crenate, very rugose on both surfaces. Flowers in dense subglobose axillary whorls. Calyx tubular, 10-12 toothed, the teeth subspinose and hooked at the apex. Corolla white, 2-lipped, the upper lip erect, 2-lobed, the lower spreading, 3-lobed. Stamens 4. Nutlets smooth.

1. M. vulgare L. Herb 60-90 cm. tall, with ascending white-woolly branches; leaves 1.5-3 cm. long, broadly ovate or subrotund, narrowed to petioles 1-2 cm. long; ~~rather bifacial;~~ whorls subtended by subulate bracts equal to the calyces; calyces 5-6 mm. long, woolly; corolla 7-8 mm. long, the lobes subequal.

A cosmopolitan weed of waste places and along roadways. Priest R., Epling. The skeleton plants often overwinter, their bony calyces disarticulating tardily from the flower spikes. Calyces dispersed by clinging to sheep and other animals.

### 6. Monardella Benth. Western Pennyroyal.

Perennial herbs more or less woody at the base with numerous ascending branching stems; leaves entire, Flowers in terminal subglobose heads subtended by membranous bracts. Calyx tubular, shortly 5-toothed, the teeth triangular. Corolla tubular, 2-lipped, the upper lip bifid, the lower 3-lobed, the segments all subequal, lanceolate. Stamens 4, exserted. Nutlets smooth.

1. M. odoratissima Benth. ~~A very fragrant perennial with~~ stems 25-50 cm. tall, tufted, thinly pubescent above; leaves lanceolate, 2-3 cm. long, 5-8 mm. broad, glabrous or nearly so, acutish, ~~narrowed at the base to a petiole 1-2 mm. long, entire~~; bracts ~~membranous,~~ ovate or elliptical, obtuse, veiny, pubescent, ciliate, 1-1.5 cm. long; calyces 10 mm. long, the teeth ~~triangular,~~ 1 mm. long, hirsute with spreading hairs; corolla rose-purple, 16-17 mm. long, the lips 6-7 mm. long; nutlets 2 mm. long., (Madronella odoratissima Greene). Cap.

Rocky bank along the upper valley of the Clearwater R., Epling; Orofino Cr., Epling and Putnam; near Orofino under yellow pine, Epling.

petiolate

## 7. Prunella L. Self-Heal.

Herbs with creeping slender rootstocks and erect stems with entire leaves. Flowers in dense terminal cylindrical spikes, subtended by orbicular bracts. Calyx strongly 2-lipped, the upper lip truncate, 3-toothed, the lower bifid. Corolla blue or purple, strongly 2-lipped, the upper arching and galeate, the lower 3-lobed. Stamens 4. Nutlets smooth, mucilaginous when wetted.

var. lanceolata Fern.

1. P. vulgaris L. Perennial herbs with erect or ascending stems 15-45 cm. tall, thinly pubescent~~, the internodes mostly longer than the leaves~~; leaf-blades 2-8 cm. long, narrowly ovate or oblong, obtuse or rounded at the apex, attenuate at the base to slender petioles 1-4 cm. long, ~~entire,~~ thinly pubescent; ~~flowers in a dense cylindrical purplish~~ spike 2-4 cm. long, the bracts subrotund, subequal to the calyces, abruptly acuminate, membranous, veiny, the margins ciliate; calyx 10-12 mm. long, hirsute beneath, the upper lip 5-7 mm. long, 3.5-5 mm. wide, with 2 narrow decurrent wings, the teeth broad and truncate but mucronate, the middle one twice the width of the laterals, the lower lip 6 mm. long, cleft nearly to the base, the lobes lanceolate, acute; corolla ~~purple or purplish blue~~ 12-16 mm. long, the tube subequal to the calyx, dilated above, the upper lip ~~strongly galeate and gibbous~~ 5.5-6 mm. long, the middle lobe of the paler lower lip twice the size of the laterals, the margins fringed; nutlets brown, 2 mm. long.

Frequent in moist grassy places along roads, at the borders of woods and in meadows.

## 8. Trichostem~~m~~a L. Blue Curls.

Annual strongly scented herbs with entire leaves. Flowers perfect, in axillary clusters. Calyx campanulate, deeply 5-cleft, the lobes unequal, the upper 3 longer and partly united. Corolla with a narrow tube and oblique limb.

1. T. oblongum Benth. Stems simple or branching, 15-30 cm. tall, softly pilose with spreading hairs; leaf-blades oval, 1-2.5 cm. long, obtuse or cuneate at the base and at both ends, narrowed at the base to a petiole 3-6 mm. long, entire, softly pilose; flowers few in axillary cymes; pedicels 1-1.5 mm. long, increasing somewhat in fruit; calyx 3 mm. long, pilose-hirsute, its lobes lanceolate, subequal, acute, increasing to 5 mm. in fruit; corolla violaceous, the tube 2.5 mm. long, the lobes somewhat shorter; stamens exserted 3-4 mm., arching; nutlets 1.5 mm. long, obovate, reticulately sculptured, minutely hirtellous on the ridges.

Along roadways and in fields at low elevations.

no 4 → Julietta, Henderson 2746.

## 9. Mentha (Tourn.) L. Mint.

Strongly aromatic herbs with horizontal rootstocks and serrate leaves. Flowers perfect, small, in axillary clusters or in terminal slender panicled spikes. Calyx campanulate, equally 5-toothed, the teeth triangular. Corolla campanulate, appearing nearly equally 4-lobed, the uppermost lobe somewhat larger. Stamens 4, exserted. Nutlets smooth.

O Flowers in axillary clusters — 1. M. arvensis

O Flowers in terminal spikes

  2 Spikes 3-6 cm. long, 6-8 mm. wide, acute — 2. M. spicata

  2 Spikes 1-3 cm. long, 12-14 mm. wide, rounded — 3. M. piperita

1. M. arvensis var. glabrata (Benth.) Fern. Stems from creeping white rootstocks, erect, 20-60 cm. tall, simple or branching with ascending branches, glabrous below, retrorsely hispidulous above, especially on the acute angles; leaves 2.5-5 cm. long, elliptical-ovate, acute or lightly acuminate, sharply serrate, both surfaces glabrate or the veins and margins ciliolate, borne on indefinite petioles 2-10 mm. long; axillary clusters 1.5-2 cm. in diameter, subtended by subulate bractlets; calyces 2.5-3.5 mm. long, hispidulous, the lobes triangular-lanceolate, acute, .8-1.3 mm. long, the tube funnelform, globose in fruit; corolla white or tinged with pink, 5-6 mm. long, the tube 3 mm. long, funnelform, the lobes oblong-ovate, spreading, the upper slightly notched, the throat hairy; nutlets subglobose, 1 mm. long.

Common in sandy or rocky places along streams and lake shores; in meadows.

var. lanata Piper. Similar, the stems and usually the calyces woolly with white spreading hairs, the leaves sometimes woolly, more often short-pubescent.

2. M. spicata L. Spearmint. Stems 60-100 cm. tall or more, glabrous; leaves 3-7 cm. long, dark green, elliptical-oblong, acute, rounded at the base, subsessile, the lower surface hirtellous; spikes terminal, panicled, ~~spikes~~ 3-6 cm. long, 6-8 mm. wide, the glomerules subtended by lanceolate very acute bracts 3-6 mm. long; calyces 1.5 mm. long, the lobes subulate, subequal to the tube, hirtellous; corolla white, tinged with pink, 2.5 mm. long, glabrous, the lobes 1 mm. long.

Occasional in dooryards and waste places. Wallace; Princeton.

3. M. piperita L. Peppermint. Stems erect, slender, unbranching, 40-60 cm. tall, sparingly pubescent with curved hairs; leaves 2-5 cm. long, oval, oblong or ovate, mostly blunt, narrowed and rounded at the base, on petioles 2-4 mm. long; oblong, terminal, spikes 1-3 cm. long, 12-14 mm. wide, rounded at the apex; bracts few, subulate or needle-like, 2-3 mm. long; pedicels 1.5-2 mm. long; calyces 3 mm. long, glabrate, the teeth narrowly deltoid, very acute, about 1 mm. long; corollas 4 mm. long, the lobes lavender or pink.

Forming dense clumps in a small meadow near Harvard, Ellison.

## 10. Agastache Clayton. Wild Hyssop.

Tall perennial herbs with rootstocks and coarsely toothed leaves. Flowers in dense terminal cylindrical spikes. Calyx tubular, subequally 5-toothed. Corolla tubular, the upper lip erect, emarginate, the lower lip 3-lobed, spreading. Stamens 4, the longer pair inserted below the upper lip, both pairs unequally exserted. Nutlets smooth.

1. A. urticifolia (Benth.) Rydb. Stems several from a woody crown, branching above, puberulent or glabrous; leaves broadly triangular-ovate, the blades 2.5-5 cm. long, mostly obtuse, broadly cordate or truncate at the base, the margins coarsely dentate, both surfaces glabrous, the principal veins arising from near the base; ~~flowers in dense cylindrical~~ somewhat tapered, spikes 4-16 cm. long, 2.5-4 cm. broad; calyces sessile, 10-11 mm. long, membranous, the teeth ~~subequal,~~ 3-6 mm. long, lanceolate, very acute, subscarious, white or tinged with rose; corolla rose, violet or white, tubular, the tube 13-15 mm. long, the upper lip ~~erect,~~ 1.5 mm. long, ~~emarginate,~~ the middle lobe of the lower lip deflexed, 2.5 mm. wide, the laterals very short; ~~stamen pairs 4 and 6 mm.;~~ nutlets 1.7 mm. long, smooth.

Frequent along roadways at low elevations or extending as high as 6000 ft. on brushy moist subalpine slopes.

## 11. Moldavica (Tourn.) Adans.

Erect herbs with coarsely toothed leaves. Flowers in dense axillary clusters, the uppermost forming dense ovoid spikes. Calyx tubular, 5-lobed, the lobes unequal, each sinus provided with a small callosity. Corolla narrowly funnelform, 2-lipped, the upper lip emarginate, erect, the lower 3-lobed, spreading. Stamens 4, the pair inserted beneath the upper lip the longest. Nutlets smooth.

1. M. parviflora (Nutt.) Britton. Rather stiffish erect herbs 20-60 cm. tall, the stems branching above, thinly hirtellous; leaf-blades oblong-lanceolate, 3-6 cm. long, obtuse, narrowed at the base to hirsute petioles 1-3 cm. long, the margins coarsely toothed, the lower surface hirtellous; ~~flowers in dense~~ clusters ~~in the upper axils or crowded into ovoid spikes,~~ subtended by elliptical spinose bracts .5-1.5 cm. long; calyces 12-13 mm. long, hirsute, the mouth oblique, the lobes subequal to the tube, unequal, the uppermost ovate, the four lower lanceolate, the laterals broader than the two lowermost, all acuminate into short spines; corolla pale blue, the tube 8-10 mm. long, the upper lip emarginate, 2.5-3 mm. long, 3.5 mm. broad, the lower lip 3-lobed, 3-4 mm. long, the middle lobe twice as broad as the laterals; stamens lying within the laterally arched upper lip, the anthers divergent; nutlets black, dull, 2.2 mm. long. (Dracocephalum parviflorum Nutt.).

Occasional in grassy meadows at lower elevations. Priest R. Exp. Sta., 2700 ft.; Bungalow R. S., 3000 ft.; Fork St. Maries R., 3200 ft.; Granite Cr.; Headquarters.

## 12. Dracocephalum (Tourn.) L.

Perennial herbs with horizontal rootstocks and shallowly serrate leaves. Calyx campanulate, equally 5-toothed, the teeth triangular. Corolla strongly funnelform, 2-lipped, the upper lip entire, the lower lip 3-lobed. Stamens 4. Nutlets smooth.

1. D. Nuttalli Britton. Stems erect, 30-50 cm. tall, hollow, unbranched, glabrous; leaves 2-8 cm. long, 4-20 mm. wide, oblong-lanceolate, mostly acute, rounded at the base and sessile, or the lowermost narrowed at the base, glabrous, shallowly but sharply serrate; flowers in terminal spicate racemes, usually ternate, sometimes panicled, subtended by ovate puberulent bracts 3-4 mm. long; calyces tubular-campanulate at anthesis, 4-5 mm. long, puberulent, the teeth 1-1.5 mm. long, omewhat ccrescent, the calyx becoming broadly campanulate; corolla rose-purple, 12-13 mm. long, 4 mm. wide in the throat, obliquely veined, the lips 2.5-3 mm. long, the lower decurved, the upper arching; nutlets 2.5 mm. long, smooth, the angles acute. (Physostegia parviflora Nutt.).

Occasional in boggy meadows and along lake shores. Clark~~s~~ Fork Valley, 2100 ft.; Sandpoint; Port Hill; Hope.

## 13. Lamium L. Dead Nettle.

Low herbs with crenate-dentate leaves, the uppermost crowded, subsessile. Flowers perfect, in axillary clusters in the uppermost axils. Calyx campanulate, 5-lobed, the lobes subequal. Corolla strongly 2-lipped, the upper lip galeate, the throat expanded, the lower lip 3-lobed. Stamens 4, the pair inserted below the lower lip longer. Nutlets minutely roughened.

1. L. amplexicaule L. Stems, 15-20 cm. tall, the lower internodes much exceeding the leaves; leaves broadly ovate, 1-2 cm. long, the lower on petioles as long or longer, all hirsute; calyces 7 mm. long, the lobes

lanceolate-acuminate, longer than the tube, hirtellous; corolla rose-purple, 14-15 mm. long, the upper lip erect, 4-5 mm. tall, the throat funnelform, the lower lip spotted, the lateral lobes tooth-like, the middle bifid; stamens erect under the upper lip; nutlets minutely roughened.

A sporadic cosmopolitan weed of waste places, roadways, etc.

## 14. Nepeta L.

Perennial herbs with toothed or crenate leaves, the stems erect or prostrate. Flowers in small axillary clusters or in terminal panicled spikes. Calyx equally 5-toothed. Corolla white, tinged with rose or blue, 2-lipped, the upper lip concave, subgaleate, notched, the lower 3-lobed. Stamens 4, those inserted beneath the upper lip longest. Nutlets smooth.

0 Erect plants 1 m. tall or more; flowers white 1. N. Cataria
0 Prostrate plants, rooting at the nodes; flowers blue 2. N. hederacea

1. N. Cataria L. Catnip. Stems erect, branching, 1 m. tall or more, ashy-tomentose; leaves numerous, the blades 3-5 cm. long, ovate, acute, deeply cordate at the base, the lobes rounded, the margin coarsely serrate-dentate, both surfaces softly ~~asy~~ ashy-tomentose, petioles 1-1.5 cm. long; flowers crowded in terminal more or less panicled spikes; calyx tubular, 7 mm. long, canescent, the mouth oblique, the teeth subequal, 2 mm. long, subulate-acuminate; corolla 2.5 mm. long, the lower lip spreading, rosy-punctate, the lateral lobes deflexed, the middle lobe spreading, eroded, 5 mm. wide, 3 mm. long, palate provided with 2 tufts of hairs; anthers purple, included.

Occasional along roadways at low elevations. Thatuna Hills.

2. N. hederacea (L.) Trev. Ground Ivy. A pretty herb with creeping slender stems rooting at the nodes; leaf-blades rotund-reniform, crenate-dentate, hirtellous, 2-4 cm. broad, long-petiolate; flowers 2-3 in axillary clusters; calyx tubular, 5 mm. long, hirtellous, the mouth oblique, equally toothed, the teeth 1.5 mm. long, acuminate; corolla light blue or violaceous, 15-20 mm. long; nutlets smooth.

Infrequent around doorsteps in moist places. Coolin; Moscow.

## 15. Stachys (Tourn.) L. Hedge Nettle.

Perennial herbs with horizontal rootstocks and serrate leaves; flowers in axillary clusters in the uppermost axils, passing into interrupted cylindrical spikes. Calyx campanulate, equally 5-lobed, the lobes subspinose at the tips. Corolla 2-lipped, the upper lip erect, entire or notched, the throat not markedly dilated, the lower lip 3-lobed, spreading, the middle lobe often notched. Stamens 4, ascending under the upper lip. Nutlets smooth.

1. S. palustris L. Rootstocks rather stout; stems erect, virgate, spreading or retrorsely hirsute above, more or less glabrate below; leaves 3-7 cm. long, subsessile, oblong or oblong-lanceolate, obtuse or acute, rounded at the base, the upper surface sparingly hirsute or glabrate, the lower paler, sparsely pubescent, the margins serrate; ~~interrupted~~ spikes 3-12 cm. long, the internodes 1-2 cm. long, the glomerules subtended by subfoliar but reduced bracts which usually exceed the calyces and are often purplish; calyces purplish, nearly sessile, 8-9 mm. long, hirsute, tubular-campanulate, the teeth triangular-subulate, 3-4 mm. long, very acute, tipped with short spines; corolla lavender, purple-spotted, the upper lip 5 mm. long, erect, entire, the lower lip 8 mm. long, the middle lobe oval, nearly plane, the laterals decurved; stamens purple; nutlets broadly ovoid, black, dull, 2 mm. long. (S. Leibergii Rydb.).

Frequent in boggy ground and along lake shores.

## Campanulaceae. ~~Bluebell~~ Bellflower Family.

Herbs with alternate simple leaves without stipules. Flowers regular, perfect, in racemes or solitary. Sepals 5, persistent. Corolla campanulate, regular, tubular or rotate, the lobes valvate in the bud. Stamens 5. Ovary inferior, 2-5-chambered; style 1. Fruit a capsule.

0 Stem leaves ovate or rotund; flowers axillary

2 Capsule top-shaped, bursting irregularly between
6 the ribs 1. Heterocodon

2 Capsule ellipsoid, opening by 2 or 3 lateral pores 2. Specularia

0 Stem leaves linear; flowers in terminal racemes,
4 rarely solitary 3. Campanula

### 1. Heterocodon Nutt.

Low annuals with alternate sessile leaves. Flowers axillary, of two sorts, the earlier cleistogamous, ie. fertilized in the bud, having no proper corolla, the later bearing a normal corolla. Sepals 5, the calyx tube obovate. Corolla short-campanulate, 5-lobed. Stamens 5. Capsule top-shaped, thin walled, 3-chambered, 3-angled, bursting irregularly on the sides.

1. H. rariflorum Nutt. Stems very slender, commonly less than .5 mm. in diameter, unbranched or sometimes branching from the base, somewhat angled, glabrous, 10-30 cm. tall; leaves commonly remote, subrotund, sessile and clasping, sharply toothed, 5-15 mm. in diameter, glabrous; flowers solitary and sessile in the axils, the corollas of the ~~early~~ later flowers ~~rudimentary, those later~~ blue, 4-5 mm. long, 5-lobed, tubular-funnelform; calyx tubes sparsely hispid, the lobes unequal, ovate, toothed; 2.5-3 mm. long, persistent; capsules subglobose 2.5-3 mm. in diameter. (Specularia rariflora (Nutt.) McVaugh).

Sandy moist places near Rathdrum, Heller 712.

## 2. Specularia (Heist.) Fabr.

Low annuals with alternate sessile leaves. Flowers axillary, the earlier cleistogamous ie. fertilized in the bud, having no proper corolla, the later bearing a normal corolla. Sepals 5. Corolla rotate, 5-lobed, Stamens 5, distinct. Capsule narrowly cylindrical, 3-chambered, opening by 3 small lateral pores by the inrolling of small flaps.

1. S. perfoliata (L.) A. DC. Venus' Looking Glass Stems erect, unbranched, or with a few weaker branches from near the base, 20-40 cm. tall, pubescent with spreading hairs; leaves broadly ovate or subrotund, 8-35 mm. in diameter, sessile and clasping the stems, crenate and thinly pubescent; flowers solitary or two in the axils, sessile, the ovaries more or less concealed by the embracing leaves; calyx lobes lanceolate, very acute, 3.5-4 mm. long, persistent; corolla violet-blue, funnel -shaped, 5-7 mm. long; capsules 6-8 mm. long; seeds lenticular, brown, minutely roughened.

Occasional in dry ground in the lower valleys. Lake Coeur d'Alene, Leiberg 1547; ~~Cocolalla~~ t Cocollala, Epling.

no H

## 3. Campanula (Tourn.) L. Bluebell.

Perennial herbs with alternate leaves. Flowers perfect, bell-shaped, displayed in racemes or rarely solitary. Sepals 5, nearly or quite free, the calyx tube wholly united to the ovary. Corolla blue, with short lobes. Stamens 5. Ovary 3-5-chambered, the styles united; stigmas 3-5. Capsule obovoid or top-shaped, opening by lateral po~~x~~es which are covered by a small incurled flap. Seeds smooth. (r)

1. C. rotundifolia L. Perennial with slender rootstocks; stems several, ascending, 20-40 cm. tall, glabrous; basal leaf-blades rotund to ovate or lanceolate, the blades .5-2 cm. long, entire or remotely serrate, even cordate or narrowed to petioles 2-4 cm. long; cauline leaves 3-5 cm. long, linear-lanceolate or linear-oblanceolate, acute, subentire, sessile; flowers several, rarely solitary, nodding, borne on peduncles 2-4 cm. long; calyx tube 2-3 mm. long, the lobes acicular, spreading, 4-6 mm. long, both increasing in fruit; corolla blue, campanulate, 12-20 mm. long, the lobes rounded, 3-5 mm. long; filaments expanded and lightly united at the base; anthers linear, 4-5 mm. long, the style subequal to the corolla; capsule 5 mm. long, obovoid; seeds oval, smooth, .8 mm. long. (C. petiolata A. DC. C. MacDougalii Rydb.)

Common throughout our region, meadows and rocky hillsides.

## Lobeliaceae. Lobelia Family.

Herbs with alternate simple leaves without stipules. Flowers perfect, irregular. Sepals 5. Corolla 2-lipped, the upper lip deeply 2-cleft, the lower less deeply 3-lobed. Stamens 5, free from the corolla but the filaments or anthers united into a tube around the style. Ovary inferior, 1-5-chambered. Style 1. Fruit a capsule.

Submerged aquatic plants; the submerged flowers cleistogamous, rudimentary
1. Howellia

Low herbs of vernal pools or swampy places which later become dry, not submerged; flowers all alike, none cleistogamous
2. Downingia

### 1. Howellia A. Gray.

Cap

Aquatic herbs with alternate linear or threadlike leaves and small axillary flowers. ~~Sepals 5, the~~ calyx tube wholly joined to the linear ovary. Corollas of the submerged flowers imperfectly developed, those of the emersed flowers with the tube cut nearly to the base on the upper side, the lobes subequal. Stamens joined into a tube around the style. Ovary one-chambered, 2-seeded, dehiscing irregularly on one side at maturity.

1. H. aquatilis Gray. → Very fragile herbs with threadlike stems 15-30 cm. long, the leaves about a third as long, the submerged ones threadlike, the emersed ones narrowly linear, sparingly toothed; ~~flowers axillary; the~~ sepals 1.5-3 mm. long; ~~the~~ corolla ~~subequal~~, 1.5-2 mm. long; capsules club-shaped 12-15 mm. long, the seeds 2, 3 mm. long, brown and shining.

inconspicuous

Spirit Lake (Lake Tessemini) Sandberg 699; since this gathering was made, the lake shore has been considerably modified by the building of a dam. It is accordingly not impossible that this species has disappeared; at any rate, I was unable to find it.

## 2. Downingia Torr.

Glabrous erect annuals with alternate, sessile, entire leaves. Flowers axillary, sessile. Sepals 5, subequal. Corolla 2-lipped, the upper deeply cleft into 2 narrow lobes, the lower lip broader, 3-lobed. Ovary resembling a stout pedicel, linear, forming a linear 1-chambered capsule with 2 parietal placentae.

1. D. elegans (Lindl.) Torr. Low annual 10-25 cm. tall, somewhat succulent, branching at the base; leaves 1-2.5 cm. long, lanceolate or ovate-lanceolate, acute, rounded at the base; flowers solitary in the upper axils; calyx lobes narrowly oblong, 4-5 mm. long; corolla blue, the lower lip with a broad white spot, the tube 2.5 mm. long, campanulate, the upper lip 9-11 mm. long, the lobes oblong, 7-8 mm. long, 1.5 mm. wide, divergent, the lower lip 8-10 mm. long, rotund in outline, the lobes triangular ovate, 3-4 mm. long, very acute; staminal column 1 cm. long, strongly curved downward at the apex; capsule 3 cm. long, with 1-2 twists.

In low muddy ground or swamps which drain in summer. St. Joe R., 2120 ft.; Lake Coeur d'Alene; Weippe; Moscow; Genesee; Lower Priest R.; St. Maries, 2700 ft.; Farmington.

## Rubiaceae. Madder Family.

Herbs with opposite or whorled leaves. Flowers perfect, regular. Calyx adnate to the ovary, its lobes present or wanting. Corolla 3-5 lobed. Stamens as many as the lobes of the corolla and alternate with them, their filaments adnate to the corolla. Ovary wholly inferior, 2-chambered. In ours fruit dry, indehiscent, the two halves separating and falling away at maturity. ~~as a 1-seeded capsule~~ =/

### 1. Galium L. Bedstraw. Cleavers.

Annual or perennial herbs (ours mostly reclining on other plants) with strongly 4-angled stems and whorled leaves. Flowers small, white or greenish, in axillary cymes or panicles. ~~Flowers perfect.~~ Calyx lobes wholly wanting. Corolla rotate, 3 or 4-parted, stamens 3 or 4. Styles 2. ~~Ovary wholly inferior, 2-chambered, each half forming in fruit an indehiscent 1-seeded carpel which may fall away independently of the other, usually bristly.~~ =/

0 Ovaries and fruits wholly glabrous; corolla 3-lobed 1. **G. trifidum**

0 Ovaries and fruits hispid or bristly; corolla 4-lobed

2 Flowers solitary in the upper axils; erect annuals 6 10-20 cm. tall 2. **G. bifolium**

2 Flowers 2-9 in axillary cymes which may be 6 panicled; stems 30-100 cm. long, mostly prostrate or reclining on other herbage

4 Leaves in 4's, 3-veined; stems mostly erect 3. **G. boreale**

4 Leaves 5-8 in each whorl, 1-veined; stems 8 prostrate or clinging to other herbage

6 Ovaries and fruits covered with minute, 10 curved thickish hairs, appressed, not spreading 4. **G. asperrimum**

6 Ovaries and fruits covered with spreading 10 hairs .5-.7 mm. long, hooked at the tip

8 Leaves prevailingly widest near the middle; 12 corolla greenish or sordid-white, the lobes 1.5-2 mm. long; prickles of fruit not pustulate at the base 5. **G. triflorum**

8 Leaves prevailingly widest above the 12 middle; corolla pure white, the lobes 1-1.5 mm. long; prickles of fruits pustullate at the base 6. **G. aparine**

(1.) G. trifidum L. var. subbiflorum Wiegand. → Perennial, the stems very slender, weak, reclining, branching above, 15-30 cm. long, the angles margined, scabrous; leaves in whorls of 4-6, linear-oblong or linear-oblanceolate, or the larger narrowly elliptical, 8-15 mm. long, 1.5-4 mm. wide, 1-veined, the margins and vein scabrous; flowers 2-3 in axillary cymes or solitary, the petals ovate, .7 mm. long, white, mostly in 3's; fruit glabrous, black, the carpels globose, each 1-1.5 mm. in diameter.

In wet or muddy ground or in swamps.

(2.) G. bifolium S. Wats. → A small erect annual 15-20 cm. tall, the stems simple or divaricately branching above, glabrous; leaves 2-4 in each whorl, unequal in size, 1-2 cm. long, 1.5-3 mm. wide, lanceolate or oblong, mostly acute, narrowed at the base, 1-veined, glabrous; flowers bractless solitary in the axils on pedicels 8-12 mm. long, soon deflexed, the corollas white; mature carpels globose-ovoid, 1.5 mm. long, armed with → slender hooked bristles mostly less than .4 mm. long.

Infrequent at high elevations in moist situations. →

no 4 → Fish Lake Cr., 5000 ft., Epling and Houck 9471; Epling and Kempf.

(3.) G. boreale L. → Rootstocks slender, the stems erect, frequently reclining [redacted] but not trailing, 30-100 cm. tall, scabrous or nearly smooth; leaves in whorls of 4, 2-4 cm. long, lanceolate to linear= =/ lanceolate, acute, rounded at the base and subsessile, 3-veined, thickish, sparingly hirtellous; [redacted] showy, terminal, panicles 10-30 cm. long, white, the bracts subfoliar, the uppermost obovate, in pairs; corolla lobes ovate-lanceolate, 2.5 mm. long, 3-veined; [redacted] mature carpels subglobose, 1.5 mm. in diameter, hispidulous with short curved hairs.

Frequent at lower elevations in meadows bordering shrubbery or on open hillsides.

(4.) G. asperrimum A. Gray. ——→ Rootstocks slender, the stems weak and reclining, 30-100 cm. long or more, very scabrous along the angles; leaves [redacted] in 5's or 6's, oblong-elliptical, 1-3 cm. long, 3-6 cm. wide, obtuse or ~~acute,~~ mucronate, very scabrous along the vein beneath and the margins; 1-veined; flowers several [redacted], the pedicels and peduncles threadlike, the cymes numerous, frequently forming leafy panicles; corolla white, sometimes tinged with pink, its lobes ovate, 1.5-2 mm. long, mucronate; mature carpels 1-1.5 mm. in diameter, [redacted] with closely appressed, short thickish curving hairs. —/

Frequent in meadows or along streams at the borders of thickets.

(5.) G. triflorum Michx. ——→ Stems, dainty, creeping over low herbage or prostrate and sometimes forming mats, 30-80 cm. long, the angles margined, glabrous or sparingly hispidulous; leaves in whorls of 6, thin in texture, narrowly oblong-elliptical, 2-5 cm. long, 6-12 mm. wide, obtuse at both ends, but mucronate, [redacted], 1-veined, nearly glabrous, the vein and margins somewhat scabrous; flowers 2-3 on widely divaricate pedicels .5-2 cm. long, [redacted] axillary cymes on slender peduncles 2-4 cm. long; corolla greenish-white, the lobes 1.5-2 mm. long, ovate, mucronate; ovary densely woolly-hispid; mature carpels 1.5-2 mm. in diameter, subglobose, covered with prickles .5-.7 mm. long, hooked at the very tips, not pustulate at the base.

Frequent in rather dry semi-open woods.

(6.) G. aparine L. ——→ Annual, 60-100 cm. tall or more, with weak reclining stems clinging to [redacted] herbage and shrubbery, retrorsely hispid; leaves 6-8 in each whorl, ~~notably wide~~ 2-4 cm. long, 3-5 mm. broad, linear-oblanceolate or oblanceolate, obtuse but narrowed to a mucro at the apex, narrowed below the middle, 1-veined, scabrous; flowers 3-5 in axillary cymes with foliar bracts, the pedicels 8-12 mm. long, the peduncles 2-5 cm. long; corolla lobes white, ——→ 1-1.5 mm. long, the stamens .6 mm. long, the anthers yellow, the ovaries densely hispid; mature carpels black, each 3-4 mm. in diameter, globose-ovoid, armed with stiff straight prickles .6-.7 mm. long, pustulate at the base, minutely hooked at the very apex.

Frequent, climbing upon brush and low herbage in usually open places, often on talus slopes or rocky lake shores at low elevations.

## Caprifoliaceae. Honeysuckle Family.

Shrubs, vines or perennial herbs with opposite mostly simple exstipulate leaves. Calyx 3-5 toothed. Corolla 5-lobed, saucer-shaped to tubular, regular or 2-lipped, often saccate at the base of the tube (in Lonicera cauriana 2 corollas seem to arise from a single ovary and calyx). Stamens 5 (in Linnaea 4), their filaments inserted on the corolla tube. Ovary wholly inferior, 1-5-chambered; fruit a capsule, berry or berry-like drupe.

0 Leaves pinnate, tall shrubs or small trees — 1. **Sambucus**

0 Leaves simple

  2 Prostrate creeping herbs; stamens 4 — 2. **Linnaea**

  2 Shrubs or vines; stamens 5

    4 Leaves palmately 3-lobed; flowers in flat-topped 8 clusters — 3. **Viburnum**

    4 Leaves not lobed, mostly entire, some sometimes 8 irregularly toothed; flowers in short terminal spikes or in pairs

      6 Corolla regular; berry white — 4. **Symphoricarp~~u~~os**

      6 Corolla 2-lipped; berry red or black — 5. **Lonicera**

## 1. Sambucus (Tourn.) L. Elderberry.

Shrubs or small trees with opposite pinnate leaves. Flowers small but numerous in rather showy terminal compound cymes. Calyx-lobes minute, 5. Corolla saucer-shaped or reflexed, regular, 5-lobed. Stamens 5, inserted on the corolla tube at its base. Ovary inferior, 3-5-chambered. Fruit a berry-like drupe, 3-5-chambered.

O Flowers and fruit in a pyramidal or ovoid cluster;
4 pith of second year or older canes chocolate or tobacco brown; berries purple-black — 2. **S. melanocarpa**

O Flowers and fruit in a flat-topped cluster; pith
4 white, sordid in older canes but not brown, berries bluish — 1. **S. glauca**

**1. S. glauca** Nutt. Blue Elderberry. An erect shrub or small tree 3-4 m. tall, the stems mostly cane-like in our region, green and very glaucous, less often forming a distinct trunk with corky, furrowed bark, the pith white, sordid in old stems but not brown; leaves 50-60 cm. long, ovate or oblong in outline, irregularly bipinnate, the primary leaflets 5-15 cm. long, either simple or 3-parted, the terminal segment much larger than the laterals, these often decurrent on the midrib, mostly rounded and very oblique at the base, the upper surface dull, the lower paler, the margins serrate; flowers creamy =/ white, in flat-topped compound cymes 20-30 cm. broad; sepals minute, triangular; corolla-lobes 2.5 mm. long; drupes flattened-globose, 4-5 mm. in diameter, black with a heavy bloom, thus appearing bluish; stones ovate-flattened, rugose. → (S. caerulea Raf.).

Frequent at lower elevations in open places.

**2. S. melanocarpa** A. Gray. Black Elderberry. → A shrub 2-3 m. tall, its stems ascending or decumbent, the mature bark mahogany color, marked with prominent corky lenticels, the branchlets green, sparingly pubescent, the pith of older wood chocolate or tobacco brown; leaves 30-40 cm. long, ovate in outline, the leaflets 5-15 cm. long, oblong or elliptical, shortly acuminate, obliquely rounded at the base, (the terminal one cuneate) the margins serrate, the upper surface glabrous, the lower sparingly pubescent; stipules glandular, often wanting; flowers in terminal ovate or pyramidal panicles commonly 6-10 cm. tall, the branchlets purple; corolla white, its lobes obovate, 2.5 mm. long; stamens yellow, subequal to the petals; drupes globose, shining, deep purple-black, 5-6 mm. in diam.; stones oblong or narrowly ovate, 2.5-3 mm. long, pitted.

Abundant in moist subalpine brushy places or meadows; rarely as low as [illegible].

## 2. Linnaea (Gronov.) L.

A prostrate creeping herb with opposite rather leathery leaves. Flowers in pairs on slender, erect peduncles. Calyx 5-toothed, the teeth deciduous. Corolla funnelform, regular, 5-lobed, Stamens 4, inserted on the tube of the corolla. Ovary inferior, 3-chambered. Fruit a 3-chambered capsule bearing 1 seed.

1. L. borealis L. var. americana (Forbes) Rehder. Twin Flower. ~~A pretty~~ mat-forming herb ~~[illegible]~~, the twigs pubescent; leaves persistent into the second year, ~~[illegible]~~ borne on erect branchlets 5-10 cm. long, the blades obovate, varying to elliptical or rotund, narrowed at the base to a short petiole, remotely and shallowly toothed above the middle, sparingly hirtellous on both surfaces or the lower glabrous, the upper rather polished; ~~[illegible]~~ peduncles about 5 cm. long, forked above, each branch subtended by a subulate bract, each flower nodding on a pedicel 2-3 mm. long, subtended by 2 subulate bractlets, the ovary subtended by an involucre of 4 unequal glandular bractlets; calyx lobes subulate, very acute, 2-3 mm. long; corolla 10-12 mm. long, ~~[illegible]~~ pallid without, pink and pilose within, the lobes 2-3 mm. long, blunt; capsule not seen.

Common in shaded woods, creeping over duff and debris.

## 3. Viburnum (Tourn.) L.

Shrubs with opposite simple leaves. Flowers white in small terminal cymes. Calyx 5-toothed. Corolla 5-lobed, saucer-shaped. Stamens 5, included, inserted near the base of the corolla. Ovary inferior, 1-3-chambered. Fruit a drupe, the stone flattened, rugose, with a flat ridge along one surface.

1. V. pauciflorum Pylaie. Squashberry. → A graceful shrub 1-2 m. tall, branching mostly from the base, the branches slender, bark grey, tinged with red, scurfy at the base, the branchlets similar, the lenticels inconspicuous, roundish, 1-2 mm. across; leaf-blades 5-8 cm. in diameter (15 cm. in shade forms) rotund in outline, shallowly 3-lobed, the lobes shortly acuminate, rounded at the base, the margins rather acutely serrate-dentate, the teeth apiculate, both surfaces glabrous, somewhat glossy, dark green above, borne on reddish petioles 1-2 cm. long; (some leaves may be elliptical and unlobed); flowers in small umbellate cymes terminating short lateral branches from the second year wood, the peduncles 1-1.5 mm. long, sparingly hirsute, each bearing 2-3 flowers on pedicels 1-3 mm. long; corolla white, its lobes 2-2.5 mm. long, subequal to the tube; stamens scarcely exserted from the cup; drupe 8-10 mm. in diameter, bright red, glossy, the stone 2 mm. thick, 6-7 in diameter, flattened-oval.

Infrequent along small shaded streams. V. opulus L., it is similar but distinguished by the larger marginal flowers, 1-2 cm. wide, may occur in the north;

## 4. Symphoricarpos (Dill.) Ludwig.

Erect or trailing shrubs with opposite, simple, mostly entire leaves. Flowers in short dense racemes, each subtended by a pair of small connate bracts. Calyx 5-toothed, the limb very short, saucer-shaped. Corolla campanulate, regular or nearly so, (4-) 5-lobed, the stamens included, inserted within the throat. Ovary wholly inferior, 4-chambered, only 2 ovules developing. Fruit a white berry.

O Stems erect or ascending, never trailing and rooting at the nodes; flowers 5-7 mm. long, slightly irregular, the lowermost petal broader, lightly gibbous toward the base, the throat densely hairy, more or less concealing the stamens 4 ..... 2. S. albus

O Stems gracefully drooping and trailing, rooting at the nodes and there forming new offsets; flowers 4.5-5 mm. long, regular, the throat villous but not densely, the stamens nearly equal to the petals at anthesis 4 ..... 1. S. mollis.

1. 2. S. mollis Nutt. Trailing shrubs 30-50 cm. tall, the stems drooping gracefully, stoloniferous, rooting at the nodes and there forming new offsets, tracable sometimes for several meters, forming dense mats, the bark mahogany color, shredding, the branchlets reddish, glabrous, soon becoming brown; buds 1.5 mm. long, bisecting the angles; leaves light green, tending to yellowish, mostly 1.5-3 cm. long, the members of each pair erect and more or less connivent, in sun-forms broadly ovate or oval, obtuse or rounded at the apex rounded at the base, entire, or the leaves of vigorous suckers irregularly lobed or coarsely toothed, the teeth blunt, upper surface glabrous, the lower softly pubescent, paler, petioles 1-2 mm. long; racemes dense, 1-1.5 cm. long, terminal on short erect or ascending branchlets, the bracts 1-1.5 mm. or less long; sepals deltoid, .5 mm. long; corolla pink, 4.5-5 mm. long the tube even, not saccate, the lobes ovate, 2.5-3 mm. long, commonly somewhat longer than the tube, more or less connivent at anthesis, the throat villous but not densely so, the style visible, the stamens bending over the style but soon erect and subequal to the petals; fruit not seen.

Frequent in the southern part of our region, abundant locally, sometimes growing with S. albus.

2. S. albus (L.) Blake. → Snow Berry. → An erect shrub .5-1.5 m. tall, its branches erect or ascending, the mature bark brown, roughened, the younger bark clay-colored, or light-brown, longitudinally striate, shredding, the branchlets widely spreading, glabrous; leaf-blades 2.5-7 cm. long, ovate or oval, blunt, rounded at the base or frequently cuneate, the margin ciliate, entire or, especially on suckers, irregularly sinuate-toothed or lobed, upper surface often bluish green, dull, glabrous, the lower paler, sometimes pubescent, petioles 2-4 mm. long; flowers in terminal racemes 1-3 cm. long, subtended by small connate ovate bractlets; calyx lobes triangular ovate, .5-1.5 mm. long, acute; corolla 5-7 mm. long, pinkish campanulate, the lobes rounded, 2.5-3.5 mm. long, the lowermost slightly broader, gibbous toward the base, the throat densely villous within, the stamens and style included, the former arching over the stigma, both more or less concealed by the hair; berries snow white, 5-10 mm. in diameter, globose. → (S. racemosus Michx.).

Common throughout our region in semi-mature brushy woods, along streams, in meadows and along roadways.

var. pauciflorus Robbins. → Smaller, suggesting a sun-form, the leaves 1.5-2.5 cm. long, thicker and more glaucous; flowers few in each raceme or even solitary in the axils.

## 5. Lonicera L.

Erect or twining shrubs with simple entire leaves. Flowers either in short terminal spikes or axillary in pairs, upon a common peduncle; terminal spike subtended by a foliaceous involucre of two connate bracts or the axillary pair similarly subtended or not. Calyx obscurely 5-toothed, or the limb entire and shallowly cup-shaped, or wanting. Corolla two-lipped or nearly regular, the tube more or less saccate at the base on one side. Stamens 5, borne on the corolla tube. Ovary 2-3-chambered. Berries subglobose, black or red.

0 Climbing shrub with slender stems, the leaves very 4 glaucous especially beneath; flowers 3.5-4 cm. long — 1. L. ciliosa

0 Erect, not twining shrubs, the leaves paler beneath, 4 hardly glaucous; flowers rarely 2 cm. long

2 Leaves 10-20 cm. long; flowers and berries sub- 6 tended by a reddish involucre 1-2 cm. long — 2. L. involucrata

2 Leaves 4-8 cm. long; flowers and berries sub- 6 tended by a pair of slender bractlets

4 Corolla 10-15 mm. long; berries blue-black — 3. L. cauriana

4 Corolla 15-20 mm. long; berries red — 4. L. utahensis

1. L. ciliosa (Pursh.) Poir. ⟶ Honeysuckle. ⟶ A straggling or climbing vine, with stems frequently several meters in length, very slender, the bark shining, falling away, the young twigs glaucous; leaf-blades 6-8 cm. long, 4-6 cm. wide, for the most part broadly elliptical or oval, obtuse at both ends, the margins ciliate, upper surface glabrous, green, the lower thinly pubescent, very glaucous; flowers several in terminal clusters subtended by an involucre of a pair of subfoliar connate bracts 2-4 cm. long; corolla bright orange-color, 3.5-4 cm. long, tubular, gibbous near the base, then gradually dilated upwards, hairy within, thinly so without, the limb 7-8 mm. long, the lobes ovate, spreading; anthers 3.5-4 mm. long; berry bright red, globose, 5-7 mm. in diameter; seeds whitish, flattened ovoid, 4-5 mm. long.

Frequent at lower elevations climbing over shrubbery or into trees in open rather dry woods.

(2.) L. involucrata (Richards.) Banks. → Black Twinberry. → An erect somewhat straggling shrub 1-2 m. tall, the mature bark clay-colored and shredding away, the new growth rectangular in cross-section; leaf-blades 10-20 cm. long, elliptical or obovate, abruptly acuminate, narrowed and subcuneate, rarely rounded, at the base, sparingly pubescent above, dull, softly pubescent and paler beneath, or both surfaces glabrous, the margin ciliate, petioles .5-1 cm. long; flowers on axillary peduncles 2-5 cm. long, the corolla yellow, 15-18 mm. long, tubular, glandular pubescent, the lobes rounded, 2-2.5 mm. long, the sac projecting about 2 mm. below the ovary; anthers slightly longer than the filaments, each pair of corollas subtended by an involucre of 2 pairs of obcordate bright red bracts 1-2 cm. long, reflexed in fruit; berries shining black, oblong, 8-10 mm. long, distinct, divergent; seeds lenticular, shining black, 2 mm. long. (Distegia involucrata ~~Cockerell~~)x. Ckll.

Along streams and in meadows throughout our region.

(3.) L. cauriana Fernald. → Blue Twinberry. → Stiffish erect shrubs 60-80 cm. tall, the mature bark brown, flaking in papery flakes, the branchlets whitish, or crimson, puberulent; leaf-blades 5-6 cm. long, 2.5-3 cm. broad, mostly obovate, frequently oval, rounded at the apex, mostly narrowed below the middle, entire, the upper surface nearly glabrous, the lower surface paler, thinly hirsute, the margins ciliate, the petioles 2-3 mm. long; flowers borne in the lower axils of the new growth on peduncles 5-6 mm. long, subtended by paired bractlets which vary from subulate and 5-6 mm. long to lanceolate or ovate and 1.5-2.5 cm. long, ciliate, hirsute; corolla yellowish, 10-12 mm. long, tapering gradually, thinly hirsute; stamens scarcely exserted; ovaries wholly united; berry bluish-black, subglobose, 7-8 mm. across. (Xylostemon caeruleum Rydb., L. (?) altaica Pallas).

Local in subalpine bogs or meadows. → Near Oxford R. S., 5000 ft., Epling and Houck 9678; Spokane Meadow, Epling and Kempf.

no ¶

4. L. utahensis Wats. Red Twinberry. Shrubs 1-2 m. tall, the bark olivaceous, somewhat shining; bud scales oval, persistent, 1-1.5 cm. long; leaf-blades 4-8 cm. long, or more in shade forms, oval, to ovate, obtuse, or rounded at the apex, rounded or even subcordate at the base, entire, dull green above, even bluish green, glabrate, subglaucous beneath, sparingly hirsute, the margins ciliate, shortly petiolate; flowers white, on axillary peduncles 1 cm. long, subtended by subulate bracts half as long as the ovaries; limb of the calyx scarcely 0.5 mm. wide, the corolla light-yellow or whitish, 15-20 mm. long, the tube villous within, the lobes 4-5 mm. long, obtuse, subequal but by position making the corolla clearly 2-lipped; ovaries almost distinct, glaucous; berries bright rod, translucent, exceeding the foliage, pear-shaped, 10-12 mm. long, joined lightly at the base, divergent; seeds straw-colored, oval, 2.5 mm. long. (Xylostemon utahense Rydb., L. u. forma ebractulata (Rydb.)St.John).

Common throughout our region.

## erianaceae. ian Family.

Herbs with opposite simple or compound leaves. lowers perfect or unisexual, borne in either open or dense cymose inflorescences. Proper calyx wanting, the tube wholly adnate to the ovary, the ovary hence appearing naked, the calyx lobes wholly wanting or represented by plumose bristles which are inrolled in flower and inconspicuous, but unrolled in fruit, forming a feathery crown to the achene. Corolla more or less irregular, somewhat two-lipped, the tube funnelform, bearing a saccate protuberance or spur at the base on one side. Stamens 1-3. Ovary wholly inferior, appearing 1-chambered, the lateral chambers suppressed or forming two wings which curve and meet on one side, forming a cavity. Fruit 1-seeded, indehiscent.

0 Annuals with simple leaves; calyx lobes wanting 1. Plectritis

0 Perennials with compound leaves; calyx lobes
4 represented in fruit by plumose bristles 2. Valeriana

## 1. Plectritis DC.

Erect slender glabrous annuals with simple entire leaves. Flowers small, borne in terminal glomerules or sessile in the upper axils. Proper calyx wanting. Corolla funnelform, two-lipped, bearing a saccate spur at the base below the lower lip. Ovary 3-chambered, two usually empty. Fruit ovoid, provided with two blunt wings which curve and partially meet on one side, forming a deep cavity.

1. P. macrocera T. & G. Stems erect, slender, unbranched, 15-30 cm. tall; leaves 2.5-5 cm. long, the lower oblanceolate, the upper oblong, all sessile[redacted]; flowers sessile, in ovoid terminal glomerules,[redacted] the bracts linear, 3-5 mm. long; corolla pinkish, 4 mm. long, the orifice oblique, the lobes subequal, scarcely 1 mm. long, the spur less; fruit 2.5-3 mm. long, shortly beaked, hirtellous.

Gravelly slopes around Lake Coeur d'Alene, Leiberg 429; Potlatch R., Henderson 2657.

## 2. Valeriana (Tourn.) L.

the

Erect perennial herbs , taproots or rootstocks with a peculiar rank odor, the leaves mostly basal. Flowers small, whitish, perfect or polygamous. ~~Proper~~ calyx ~~none~~, consisting of several plumose bristles which are curled inward in flower and inconspicuous, but unroll after dropping of the corolla and form a feathery crown in fruit. Corolla nearly regular, funnelshaped, 5-lobed, saccate near the base on one side. Stamens 3. Ovary 1-chambered; fruit an ellipsoid somewhat flattened achene, 1e veined on one face, 3-veined on the reverse. =)

0 Plants with stout taproots and thickish fleshy
4 leaves; mature achenes pubescent ... 1. **V. edulis**

0 Plants with horizontal rootstocks and fibrous roots,
4 their leaves thin; achenes glabrous

2 Corolla 6-7 mm. long; basal leaves 3-7-foliolate ... 3. ~~2.~~ **V. sitchensis**

2 Corolla 3-4 mm. long; basal leaves entire,
6 elliptical ... 2. ~~3.~~ **V. occidentalis**

(1.) V. edulis Nutt. Stems erect, 40-100 cm. tall or more, pale green, arising from a thickened taproot; basal leaves tufted, 25-30 cm. long, oblanceolate in outline, entire or divided in 3-5 linear entire segments, thinly hispidulous, 6-8 cm. long, 4-6 mm. wide, the cauline leaves similar; flowers greenish-yellow, polygamo-dioecious, borne in elongate open panicles 25-30 cm. long, the branches ascending, glabrate or puberulent; bracts membranous, lanceolate, acute, hirtellous, 3-5 mm. long; staminate corolla about 2 mm. long, the pistillate about half as large; achenes 3 mm. long, flattened-ovoid, pubescent, the pappus bristles about 12, nearly twice as long as the achene.

In fields and open places in the grassland.

no H → Near Moscow, Epling and Houck 9195; Henderson; Harvard, Epling and Luke;
no H → Mt. Pend Oreille, Christ 1214.

(2.) V. occidentalis Heller. Erect plants 40-70 cm. tall, with creeping horizontal rootstocks and fibrous roots, the stems minutely hirtellous on the angles; basal leaves simple, the blades elliptical, 3-9 cm. long, entire or obscurely crenulate, not lobed, on slender petioles 5-20 cm. long, ciliolate towards the base; cauline leaves 2-3 pairs, 5-15 cm. long, cut to the midrib into 5-9 leaflets, elliptic-lanceolate, 1.5-5 cm. long, the terminal one largest, all acute; inflorescence flat-topped, elongating in fruit; bracts lanceolate 3-5 mm. long; ovary glabrous, 1.5-2 mm. long; corolla 3 mm. long, the lobes rounded, subequal to the tube; achene 4.5-5 mm. long, glabrous, tapering upwards, 1.5 mm. wide at the base, pappus bristles about 12, slightly longer than the achene.

Cold wet prairies within the Coeur d'Alene Mts, Geyer 308; De Smet Mission, ~~850 m~~ 2700 ft., Leiberg 1010; meadow near Pierce, Epling.

(3.) V. sitchensis Bong. An erect glabrous or sparingly puberulent perennial with horizontal rootstocks and fibrous roots; stems 60-90 cm. tall, branching in the inflorescence; basal leaves 10-15 cm. long, 5-foliolate, the terminal leaflet oval or rotund, the petioles subequal to the blades, ciliate towards the base; stem leaves 3-4 pairs, 3-5-foliolate, the lateral leaflets oval or ovate, subacute, mostly 3-5 cm. long, glabrous or minutely and sparingly puberulent, sinuate-dentate or subentire, the terminal leaflet similar, usually more dentate, about twice as large; inflorescence subcorymbose, dense, at first becoming an open panicle, with usually a pair of more remote branches lower ~~[illegible]~~, the bracts lanceolate, sparingly hispidulous, 4-8 mm. long; ovary glabrous, 3-4 mm. long; corolla white or tinged with rose, sparingly hispidulous, 5-8 mm. long, the lobes rounded, subequal, scarcely 2 mm. long; stamens exserted 3-4 mm., the anthers 1.4 mm. long; style subequal to the stamens, subcapitate, filiform; achene glabrous, 5 mm. long, tapering upwards, 1.5-2 mm. wide at the base, the pappus bristles about 12, slightly longer than the achenes. =|

tr

Common at higher altitudes in subalpine meadows and along small streams.

ac

## Dipsaceae. Teasel Family.

tr Herbs with opposite or whorled leaves without stipules. Flowers in compact involucrate heads. Calyx adherent to the ovary, the limb cup-like or of several bristles. Corolla tubular, the limb 2-5-lobed. Stamens 2 or 4 inserted on the tube of the corolla, alternate with its lobes. Ovary wholly inferior, 1-chambered, forming in fruit an achene.

### Dipsacus L. Teasel.

Cap. ~~Coarse erect herbs with opposite leaves. Flowers in compact ovoid heads~~ Heads ovoid, subtended by an involucre of rigid linear bracts. Calyx 4-lobed. Corolla 2-lipped, 3-lobed. Stamens 4. Achenes 8-ribbed.

1. D. sylvestris Huds. ~~Teasel.~~ → A coarse herb 1.5-2 m. tall, the stems armed with stout spines, the internodes 10-30 cm. long, increasing upwards; leaves glabrous but armed with spines, the midvein very prominent, 25-40 cm. long, oblong-lanceolate, joined together at the base and forming a cup through which the stem passes, the margins serrate; heads ovoid, 3-5 cm. tall, subtended by an involucre of rigid curving spinose linear bracts 3-12 cm. long; flowers white with lilac lobes, the corollas 10-12 mm. long, subtended by rigid bracts which are oblong below, tapering into a sharp spine 5-8 mm. long; achenes angled.

Occasional along roadways and rights-of-way; naturalized from Europe.

no H → Moscow, Epling.

Idaho

IV

pp 739 - 863

## Compositae. Sunflower Family.

Annual or perennial herbs with usually alternate, sometimes opposite leaves, those near the base frequently tufted, differing in shape from those on the stem into which they gradually merge. Flowers individually inconspicuous but in the aggregate conspicuous or even showy, borne upon a discoid, hemispherical or conical receptacle, which is the enlarged summit of the peduncle, in dense capitate inflorescences called heads, these subtended by one or more series of usually overlapping bracts, collectively the involucre, ~~hence involucral bracts;~~ these bracts commonly green and even leaf-like or again thin and papery and variously colored. Corollas characteristically of two kinds: the first, tubular below, expanded ~~unilaterally~~ into a flat linear or oblong strap-shaped limb, these called the ray flowers or ray florets, the second, tubular or funnelform throughout and regular, being equally 5-lobed at the apex, these called the disc florets; a head may consist entirely of flowers of either kind alone or, of both, ~~most often of the mixed condition with~~ the showy ray florets forming a circle about the usually densely massed disc florets, the two kinds generally differing in color. The disc florets may be subtended by erect scales or bristles upon the receptacle, in which case the receptacle is termed chaffy, or the bracts or bristles may be wholly absent, in which case the receptacle is said to be ~~called~~ smooth, or the receptacle may be pitted. Ray florets unisexual, commonly without anthers and forming or not forming fertile achenes. Calyx tube wholly coalesced with the ovary, hence completely inferior, the calyx limb lacking or appearing in various modifications upon the summit of the ovary, these modifications called collectively the pappus, and consisting of either hair-like bristles or thin papery scales which sometimes attenuate into rigid erect spines (awns) or teeth or sometimes appearing as an inconspicuous ridge or rim, ~~as an ovary crest.~~ Stamens 5, the anthers linear, mostly united by their margins into a slender tube closely surrounding the style, the filaments distinct, sealed ~~joined to~~ the corolla. ~~(epipetalous).~~ Style bifid at its summit, the style branches often stigmatic nearly to their bases.

Ovary 1-chambered, containing a single ovule, forming an achene which is surmounted by the usually persistent ~~(though sometimes deciduous)~~ pappus; ~~assisting in fruit-dissemination;~~ the achene (especially in Tribe Cichorieae) may be attenuated into a slender beak which in turn bears the pappus.

Note: In Xanthium and Arctium the heads may be of two forms, one containing staminate flowers only, cup-shaped, formed from distinct or coalesced bracts, the other containing pistillate flowers: burr-like containing two flowers, or nutlike containing a single flower. In some genera The disc florets may frequently be unisexual, the flowers of each sex sometimes occurring on different individuals, ~~that is, dioecious,~~ as in Antennaria; the pistillate flowers may sometimes be associated in the same head with perfect flowers, sometimes with staminate ones, as in Anaphalis. In Madia and Lagophylla the involucral bracts curl laterally inwards and invest the marginal ~~flowers~~ ovaries and achenes.

1a. Heads entirely of similar flowers the corollas of which are expanded
4 into a flat oblong or strap-shaped limb which is toothed at
the apex; herbs with milky juice

2 Pappus consisting of 2-3 series of small thin scales, not bristle- =1
6 like; flowers in sessile clusters along the nearly naked
branches, sky blue
1. Cichorium

2 Pappus consisting of 1 or more series of soft bristles which in
2 species are expanded at the base, otherwise hair-like
6 but barbed or plumose; flowers terminal on elongated
often naked peduncles or in terminal clusters

4 Pappus bristles expanded at the base into a
8 flat thin scale 2. Microseris

4 Pappus bristles of equal diameter throughout

6 Leaves entirely in a basal tuft X

8 Body of the achene spinulose toward the apex 3. Taraxacum

8 Body of the achene smooth throughout 4. Agoseris

6 Leaves partly in a basal tuft partly distributed
10 along the stems

8 Achenes flattened

10 Achenes tapering above the middle; heads
14 mostly in panicles; herbage soft 5. Lactuca

10 Achenes blunt, not tapering; heads in
14 irregular umbels; herbage more or less
prickly 6. Sonchus

8 Achenes columnar or spindle-shaped, not
12 flattened

10 Body of achene tapering into a beak of
14 equal length or longer which in time
bears the pappus 7. Tragopogon

10 Body of achene beakless

12 Leaves oblanceolate or elliptical, narrowed
16 gradually toward the base 8. Hieracium

12 Leaves ovate-sagittate 9. Prenanthes

0 1 b. Heads either composed of similar flowers, the corollas of
which are tubular, equally 5-lobed, rarely threadlike, the
lobes not then apparent, or composed of 2 dissimilar types,
4 those of the disc tubular, usually 5-lobed, those of the
margin strap-shaped; juice not milky; in some cases staminate
and pistillate flowers may be borne in different heads
or upon separate plants

2a. Strap-shaped ray flowers none or inconspicuous, the
6 flowers appearing to be all tubular

4 Involucres forming ellipsoid or globose burrs which
8 cling to clothing and hair by means of their hooked
bracts or spines

6 Involucres (of pistillate flowers) ellipsoid, covered
with hooked spines, the bracts entirely coalesced to
10 form a 2-chambered fruit in each chamber of which is
a single achene 33. Xanthium

6 Involucres globose, their bracts overlapping but not
10 coalesced, each hooked at the apex 47. Arctium

4 Involucres not burr-like, their bracts spine-tipped in Cirsium
8 and Centaurea, otherwise herbaceous or papery

6 Involucral bracts densely overlapping in several series, at
10 least the outer ones tipped with spines

8 Leaves spinose on the margins 46. Cirsium

8 Leaves entire, linear-oblong 48. Centaurea

6 Neither involucral bracts nor leaves spinose

8 Marginal flowers much larger than the central
12 ones, funnel-shaped, showy 48. Centaurea

8 Marginal flowers not perceptibly larger than
12 the central ones, tubular, rarely more
than 3 mm. wide in the throat

10 Flowers few, mostly hidden, the marginal ones
14 enclosed within the incurled involucral
bracts

12 Involucral bracts boat-shaped, enclosing
16 the pistillate marginal flowers and
achenes, 1-several perfect flowers in
the center; bracts glandular 30. Madia

12 Involucral bracts strongly hooded, with a
16 tiny appendage, becoming inflated
obovate sacs opening on the inside below the middle, enclosing the pistillate
flowers and achenes; bracts woolly;
diminutive annuals 17. Psilocarphus

10 Flowers numerous, apparent, none enclosed
14 by incurled bracts

12 Pappus consisting of two rigid retrorsely
16 barbed awns at the apex of the strongly
flattened achene, these therefore
clinging tenaciously to clothing ⑯ Bidens ㉙

12 Pappus none or consisting of numerous
16 soft capillary bristles

14 3a. Pappus consisting of conspicuous soft
18 hairlike bristles equal to the
involucres or longer

18 Leaves 10-20 cm. broad, deeply
20 cordate at the base 42. Petasites

18 Leaves 1-6 cm. broad or less, not
20 cordate or shallowly so, mostly
narrowed at the base

18 Bracts herbaceous, not thin and papery

20 Involucral bracts overlapping in 2-6 series

22 Leaves truncate or subcordate at the base;
26 flowers whitish or violet

24 Flowers violet; pappus in 2 series,
28 the outer consisting of short
bristles, the inner soft and plumose — 45. Saussurea

24 Flowers greenish or yellowish white;
28 pappus in a single series, not plumose — 10. Brickellia

22 Leaves narrowed at the base; flowers yellow — 12. Aplopappus

20 Involucral bracts but little overlapping,
24 arranged in a single series, or in 2
dissimilar series — 43. Senecio

18 Bracts papery, commonly opaque white, less
22 often rose-color

20 Plants dioecious, the staminate flowers
having smooth pappus bristles which are
usually more or less enlarged toward the
apex, the pistillate flowers hair-like,
24 having pappus bristles which are barbed
and united at the base; usually small
herbs 5-30 cm. tall, their stem leaves
much reduced; flowers whitish or tinged
with rose — 21. Antennaria

20 Plants partly dioecious, the staminate heads
having only staminate flowers, the pistillate
heads having chiefly pistillate flowers with
24 a few staminate ones in the middle; flowers
yellow, the pappus neither smooth or dilated,
(see ~~third category~~ 3b) each bristle distinct; herbs 40-80 cm. tall — 20. Anaphalis

20 Plants with all flowers fertile, those near
the margin pistillate only, those at the
24 center perfect; usually erect leafy plants,
one diminutive — 19. Gnaphalium

14 3b. Pappus none or consisting of an inconspicuous
18 ridge or crown

16 Leaves deltoid, 5-10 cm. broad at the base,
densely woolly beneath; achenes 4-6, beset
20 with stalked glands, at length spreading
like spokes in a wheel — 18. Adenocaulon

16 Leaves not deltoid, achenes not as described

18 Heads 1-4 cm. tall

20 Heads 3-4 cm. tall; bracts herbaceous;
24 flowers purple — 2~~1~~ ⑤. Rudbeckia

20 Heads 1 cm. tall or less; bracts papery;
24 flowers greenish-yellow — 40. Matricaria

18 Heads 3-6 mm. tall

20 Heads all similar, the flowers all fertile;
24 bracts not united to form a cup-like involucre

22 Heads in elongate panicles or racemes — 41. Artemisia

22 Heads in flat-topped or convex corymbs

24 Leaves crenately toothed — 38. Chrysanthemum

24 Leaves pinnatifid — 39. Tanacetum

20 Heads of two kinds, the staminate
24 pendulous in racemes, with cup-shaped involucres of coalesced bracts, the pistillate borne below the staminate in the upper axils, inconspicuous, 1-flowered, the involucre completely investing the flower and achene — 32. Ambrosia

2 (2b.) 2. Strap-shaped ray-flowers present

4 4a. Ray flowers blue, pink, purple or white, not yellow

6 Pappus of hairlike bristles; leaves entire or
10 merely toothed (except Erigeron compositus)

8 Involucral bracts in 2-3 series, rarely 4,
12 their tips thin and scarious; ray-corollas 1 mm. wide or less with one exception — 16. Erigeron

8 Involucral bracts in several series, usually
12 unequal, their tips commonly herbaceous; ray-corollas mostly more than 1 mm. wide — 15. Aster

6 Pappus none; leaves pinnately lobed or divided

8 Disc-flowers each subtended by an erect bract,
12 the receptacle therefore chaffy

10 Achenes terete [illegible], [illegible]-angled — 36. Anthemis

10 Achenes flattened, smooth, the margins
14 thickened — 37. Achillea

8 Disc-flowers and receptacle naked;
12 achenes cylindrical, longitudinally ribbed 38. Chrysanthemum

4 4b. Ray flowers yellow

6 Ray-flowers and achenes enclosed by the incurled
10 involucral bracts; flowers few, inconspicuous,
the heads slenderly ovoid

8 Heads glandular with stalked glands 30. Madia

8 Heads hirsute, not glandular 31. Lagophylla

6 Ray-flowers and achenes not enclosed by the
10 involucral bracts

8 Pappus consisting of 4 rigid retrorsely barbed
12 awns at the apex of the strongly flattened
achenes, these therefore clinging tenaciously
to clothing 29. Bidens

8 Pappus consisting of 2 minute teeth at the apex
12 of the achene; bracts of two dissimilar series,
the outer green, the inner membranous but firm,
oval or ovate, brown or orange in color ) 22. Coreopsis
(see third category)

8 Pappus not as described, consisting either of
12 soft hair-like bristles equal in diameter
throughout or of several membranous scales which
may taper into a membranous awn, these sometimes
deciduous or wanting

10 5a. Pappus consisting of membranous sometimes awned
14 scales, or wanting, not of hair-like bristles;
receptacles mostly with chaffy bracts

12 6a. Disc flowers each subtended by an erect chaffy
16 or awl-like bract

14 Tufted herbs with flower-bearing stems but
18 little longer than the tuft of basal
leaves which are commonly 30-40 cm. long
or more

16 Leaves silvery with soft wool, deltoid 23. Balsamorhiza

16 Leaves green and sticky, lanceolate 24. Wyethia

14 Herbs with erect leafy stems; leaves
18 rarely 20 cm. long

16 [illegible] 26. [illegible]

16 Leaves elliptical or oblanceolate

18 Achenes densely hispid 27. Gaillardia

18 Achenes glabrous

20 Disc flowers purple; pappus none 26. Rudbeckia (5)

20 Disc flowers yellow but with purple
24 stamens; pappus of two soft
membranous awns 28. Helianthella

12, 6b. Disc flowers not subtended by bracts, the receptacle
16 hence naked

14 Involucral bracts densely overlapping in several
18 series, their tips recurving, all resinous and
sticky 11. Grindelia

14 Involucral bracts not as described

16 Achenes hispid; leaves entire or merely toothed,
20 glabrate or pubescent 34. Helenium

16 Achenes glabrous, longitudinally ribbed; leaves
20 pinnatifid, white-woolly 35. Eriophyllum

11 5b. Pappus consisting of soft hairlike bristles

12 Stem-leaves opposite 44. Arnica

12 Stem-leaves alternate

14 Pappus in two series, the outer much shorter than
18 the inner; leaves 3-6 mm. broad 13. Chrysopsis

14 Pappus in a single series; leaves 1-5 cm. broad, or,
18 if less, the heads solitary

16 Heads numerous and small, arranged in panicles,
20 their involucral bracts 3-5 mm. long, rarely
more 14. Solidago

16 Heads solitary or few arranged in flat-topped
20 clusters, their involucral bracts 5-10 mm.
long or more, rarely less

18 Bracts in 3-4 series; pappus buff-color; heads
22 solitary or few in racemes ~~29~~ Aplopappus (12)

18 Bracts in 1-2 series; pappus white; heads
22 several in subumbellate flat-topped clusters,
solitary in one species 49. Senecio (3.)

## Tribe Cichoriэae.

Herbs with milky juice; the leaves chiefly basal, the stem leaves alternate; flowers all perfect, with strap-shaped corollas; anthers sagittate or auricled at the base, usually appendaged at the apex; style branches stigmatic throughout on the inner side.

## 1. Cichorium (Tourn.)L. Chicory.

Perennial herbs with mostly basal leaves and nearly naked branches. Involucral bracts in 2 series. the inner somewhat enfolding the achenes at the base. Corollas blue. Achenes 5-angled, truncate, with a pappus of small scales.

1. C. Intybus L. Much branched weedy herb with stiffish ascending stems; leaves clasping the stems, lyrate-pinnatifid, the upper floral entire or subentire; flowers axillary, fasciculate; corollas sky blue, 2 cm. long.

An infrequent colonial weed, introduced from Europe.

leaves

## 2. Microseris Don.

Perennial herbs with stout or tuberous roots, and basal leaves. ~~in a basal tuft, and milky juice.~~ Heads radiate, mostly solitary, displayed upon elongated nearly or quite naked peduncles; ~~their~~ involucres of 2-4 series of erect, herbaceous glabrous bracts; receptacle flat, naked. Flowers yellow. Achenes columnar, 8-10-ribbed, truncate at the apex, not beaked, bearing a pappus of soft bristles which are flattened and more or less expanded towards the base.

0 Bracts of the involucre in 3-4 unequal series; leaves
4 deeply pinnatifid into a few attenuate spreading segments, rarely entire — 1. M. nutans

0 Bracts of the involucre in 2 subequal series; leaves
4 entire, linear — 2. M. troximoides

1. M. nutans (Geyer) Gray. Rather weedy-looking plants 10-30 cm. tall, ~~with vertical tuberous roots,~~ glabrous, or sparingly provided with a minute scurfy pubescence; leaves much attenuated, 10-20 cm. long, mostly lanceolate or linear-lanceolate in outline, rarely entire, usually cut nearly to the midrib into several linear attenuate entire segments 1-2 mm. wide, the principal portion of the blade 2-5 mm. wide, peduncles exceeding the leaves, somewhat enlarged in the upper portions; heads 10-20 flowered, the buds narrowly ovate attenuate, nodding; bracts of the involucre in 3 or 4 series, the outermost subulate or linear, 3-5 mm. long, the inner gradually larger, lanceolate, attenuate, the innermost series 12-18 mm. long, all thinly scurfy-pubescent; corollas yellow, the outermost somewhat longer than the bracts; achenes minutely scabrous, 6 mm. long, the pappus white, its expanded portion oblong, 1 mm. long. =/

Frequent in the grassland on low hillsides in gravelly soil.

2. M.troximoides A. Gray. Low glabrous perennial herbs with stout vertical roots 5-10 cm. long; leaves 5-15 cm. long, 3-8 mm. wide, entire or nearly so, rather glaucous, ciliolate on the margins and midvein beneath, gradually tapering, acute; heads erect on naked scapes 15-30 cm. long, the involucral bracts lanceolate, acute or acuminate, greenish with a purple midrib, 12-14 mm. tall; corollas yellow, 2 cm. long; achenes 8-10 mm. long, the pappus a series of flattened bristle-like scales, attenuate, broader toward the base, barbed.

Frequent in dry gravelly prairies in or near the grassland.

## 3. Taraxacum (Haller) Ludv.

Perennial or biennial herbs with ~~milky juice and~~ leaves in a basal tuft, the heads solitary upon erect naked hollow peduncles. Involucres of several series of herbaceous overlapping bracts, the outer reflexed, the innermost series erect, the receptacle flat, naked. Flowers yellow. Achenes columnar, 4-5-angled, 8-10-ribbed, spinulose at the apex, attenuate into a threadlike beak which bears the soft white pappus.

1. T. vulgare ~~Weber~~ (Lam.) Schrank. Dandelion. Glabrous or sparingly pubescent with soft white hairs, the leaves most variable, 5-20 cm. long, prevailingly oblong-lanceolate, irregularly pinnatifid or toothed, the teeth or lobes very acute, more or less deltoid, commonly curving downwards, the principal teeth or lobes interspersed with numerous smaller ones; peduncles 5-30 cm. long, depending upon the size of the plant; involucre ovoid-cylindrical, consisting of 3-5 series of oblong-lanceolate glabrous bracts, ~~all but~~ innermost series ~~recurved or reflexed, the~~ 10-20 mm. tall, the bracts scarious-margined; ~~flowers yellow;~~ achenes brown, the body 2-2.5 mm. long, spinulose toward the apex, the beak and pappus white and shining. (Leontodon tarax~~i~~acum L.). ~~Taraxacum Taraxacum Karst.~~ =/

A very familiar weed of waste places and around habitations, occurring frequently ~~frequently~~ in burns; introduced from Europe.

## 4. Agoseris Raf.

Perennial herbs with stout taproots or in one species a small annual, all with basal leaves and milky juice. Heads displayed on erect naked peduncles which exceed the tuft of leaves, their involucres bell-shaped or cylindrical, consisting of 2-several series of unequal or subequal usually lanceolate bracts; receptacle flat, naked. Flowers yellow or orange, becoming pinkish or purplish in age. Achenes spindle shaped, longitudinally ribbed, or in one species, the ribs of the outer series replaced by wavy wings, all either tapering into a usually slender beak, at the apex of which is the tuft of shining white pappus or lightly narrowed at the apex and not at all beaked.

0 Slender annuals with roots rarely 1.5 mm. in diameter;
4 leaves mostly less than 10 cm. long ⊗ — 1. A. heterophylla

0 Perennials with stout taproots 2-6 mm. in diameter or
4 more, often with a branching caudex; leaves mostly 10-30 cm. long

2 Corollas a rich orange color

4 Leaves mostly 1-2 cm. wide; body of mature achenes
8 5.5-6 mm. long, the beak 6-7 mm. long — 2. A. aurantiaca

4 Leaves mostly less than 1 cm. wide, often 4-5 mm.
8 wide; body of the mature achenes 6-8 mm. long, the beak subequal — 3. A. gracilens

2 Corollas yellow

4 Mature achenes tapering into a beak as long as the
6 body or longer

6 Achenes 8 mm. long, tapering into a beak nearly
10 as long — 4. A. elata

6 Achenes 4.5-5.5 mm. long, the slender beak
10 15-18 mm. long — 5. A. grandiflora

4 Mature achenes somewhat narrowed or tapering into
8 a short beak not more than half as long as the body

6 Beak of the achenes about half as long as the
10 body, at any rate not obscure — 6. A. scorzoneraefolia

6 Beak of achenes wanting or obscure

8 Foliage glabrate; leaves prevailingly
12 15-30 cm. long — 7. A. [illegible]

8 Foliage villous; leaves prevailingly less
than 15 cm. long — 8. A. [illegible]

1. A. heterophylla (Nutt.) Greene. A small annual 12-25 cm. tall, its leaves variable, linear-oblanceolate or oblong, 3-15 cm. long, mostly obtuse, entire, or more or less pinnately toothed or lobed, sparingly woolly;; peduncles usually several, somewhat arcuate-ascending, slender, less than 1 mm. in diameter, sparsely hairy, 5-15 cm. tall; involucral bracts in 2-3 unequal series, the outermost ovate at the base, rather abruptly acuminate, less often lanceolate, thinly villous, the inner thinner, more lanceolate, tapering less abruptly, glabrous or villous along the middle, 12-15 mm. long at maturity; corollas pale yellow, becoming lavender in age, 6-8 mm. long; achenes of two sorts, those of the marginal flowers 4 mm. long with fluted crinkled ribs, those of the middle flowers somewhat longer, with ribs rounded and blunt, all attenuate into threadlike beaks 8-9 mm. long which bear at the apex the crown of shining white pappus.

Frequent in dry ground in the grassland.

2. A. aurantiaca (Hook.) Greene. Perennial herbs with stout tap roots, their leaves prevailingly linear-oblanceolate, 16-30 cm. long, mostly 1-2 cm. wide, attenuate below, acute at the apex, sparingly denticulate or entire, glabrous and rather glaucous; sometimes ciliate on the margins at the base of the petiole; peduncles commonly solitary, 20-40 cm. tall, wooly at the apex; bracts 12-18 mm. long, arranged in about 3 series, the outer oblong-lanceolate, 3-5 mm. broad, the inner narrower, all glabrate but ciliate on the margins, acute; flowers rich orange, becoming purple in age, 15-18 mm. long; achenes 5.5-6 mm. long, the beaks 6-7 mm. long.

Ridges south from Wiessner's Peak, 6250 ft. ~~1920 m.~~, Leiberg 1402; Sandberg 862.

3. A. gracilens (Gray) Kuntze. Perennial herbs with rather stout tap-roots, their leaves prevailingly linear-oblanceolate, sometimes linear, 10-40 cm. long, 3-12 mm. wide, often entire, some ~~at least~~ more or less sharply toothed or lobed near the middle, all acute, mostly glabrous but woolly especially along the margins near the base; peduncles commonly solitary, 25-40 cm. tall, thinly woolly towards the base, densely so beneath the involucre; bracts narrowly lanceolate, acute, arranged in 2-3 subequal series, 2-2.5 cm. long at maturity, ciliate towards the base, for the rest glabrous; flowers rich orange, becoming purple, 12-15 mm. long; achenes 8 mm. long, the ribs very minutely scabrous, tapering rather abruptly into a beak which is subequal to or somewhat shorter than the body, bearing at its apex the pappus.

Common in dry ground and burns on rounded mountain tops and ridges.

(4.) A. elata (Nutt.) Greene. → Perennial herbs with several basal leaves 10-30 cm. long, oblanceolate or linear-oblanceolate in outline, acute, attenuate below, sparingly villous on both surfaces; peduncles 30-50 cm. tall, sparingly villous; bracts 15-25 mm. long, oblong-lanceolate, acute, the inner rather thin and membranous, the outer ciliate near the base; corollas yellow; achenes 8 mm. long, tapering into a slender beak nearly as long.

¶ → Montane meadows.

(5.) A. grandiflora (Nutt.) Greene. → Perennial herbs with numerous basal leaves 15-50 cm. long, oblanceolate or nearly linear in outline, attenuate, prevailingly more or less irregularly pinnatifid into acute spreading or sickle-shaped segments, glabrous or sparsely villous; peduncles 30-60 cm. long, woolly at the apex; involucre bell-shaped, the bracts in about 5 unequal series, the outer ovate, acuminate, herbaceous, pubescent on the margins and toward the base, the inner linear-lanceolate, membranous, glabrous, 3-3.5 cm. long at maturity; corollas 15-18 mm. long, yellow; achenes 4.5-5.5 mm. long, spindle-shaped, scabrous on the ribs gradually attenuate to a threadlike beak 15-18 mm. long which bears upon its expanded apex the crown of shining white pappus.

Frequent in gravelly soil, in dry burns and along roadways at low elevations.

(6.) A. scorzoneraefolia (Shrad.) Greene. → Perennial herbs with several basal leaves 10-30 cm. long, 5-20 mm. wide, prevailingly narrowly oblanceolate, acute, entire or toothed toward the middle with spreading deltoid teeth, 2-4 mm. tall, glabrous or sparingly villous, heads solitary on stout peduncles 30-60 cm. tall, glabrous or sparingly villous, densely woolly at the base of the involucre; bracts of the involucre sharply lanceolate or linear-lanceolate, 15-30 mm. long, disposed in 3-4 subequal series, glabrous or sparsely villous, at least on the margins, the inner thinner and commonly speckled with purple; corollas 15-16 mm. long, pale yellow with purple veins becoming pinkish in age; achenes 6-8 mm. long, slowly narrowed into a beak 3-4 mm. long. →

no ¶ → (A. glauca var. scorzoneraefolia Piper).

Common along roadways in the grassland.

(7.) A. glauca (Pursh) Steud. → Perennial herbs with stout taproots, the caudex frequently branching; leaves 15-30 cm. long, oblanceolate or linear-oblanceolate, acute at the apex, tapering toward the base, entire or sparingly dentate toward the middle less frequently lobed with a few spreading acute lobes like a shark's fin, glabrous or thinly villous especially on the margins; heads solitary on stout peduncles 30-60 cm. tall, sparingly villous, densely so below the inflorescence; bracts lanceolate, 15-20 mm. long, ~~lanceolate,~~ acute or acuminate, the margins ciliate, for the rest glabrous; corollas pale yellow, 25-30 mm. long, becoming pinkish in age; achenes 10 mm. long, tapering toward the apex but hardly narrowed into a beak or if so an obscure one.

Forks of St. Maries ~~Mary's~~ River, (3250 ft.) ~~1000 m~~, Leiberg 1183. →

no ¶ → ~~The following two species, [illegible]~~ A. scorzoneraefolia and A. villosa are considered by some botanists as ~~varieties~~ variants of A. glauca. The relationship appears to be very close.

8. A. villosa Rydb. → Perennial herbs with stout tap roots and usually branching caudex, the leaves 8-15 cm. long, prevailingly oblanceolate and entire, rather obtuse, more or less villous upon both surfaces; peduncles often several, 10-30 cm. tall, villous; bracts 15-20 mm. long, mostly lanceolate, commonly acuminate but often tapering toward the base, villous and strongly ciliate on the margins; corolla pale yellow, 25-28 mm. long, becoming pinkish in age; achenes 8 mm. long, not at all beaked, somewhat narrowed at the apex. →

no ¶ → (A. glauca var. villosa ~~Witt.~~ Wittrock).

¶ → Grasslands.

## 5. Lactuca (Tourn.)L. Lettuce.

Tall biennial or perennial herbs with strict stems, usually glaucous, and abundant milky juice. Leaves frequently pinnatifid at least in the lower parts, the upper usually entire, the lobes acute. Heads radiate, oblong, their involucres consisting of several series of unequal erect lanceolate bracts which become strongly reflexed in fruit; receptacle naked. Flowers yellowish or whitish or blue. Achenes strongly flattened, more of less elliptical and curving, ribbed on both faces, ~~tapering at the apex either into a short neck or into a slender beak which may exceed the body, bearing at its apex the usually white soft pappus.~~ tapering into a short neck or slender beak.

0 Leaves clasping the stems

  2 Midribs bearing prickles, on the lower surface — 1. L. Scariola

  2 Midribs smooth

    4 Achenes narrowed into a short neck at the apex 8 upon which the pappus is borne; terminal lobes of the leaves deltoid, 4-6 cm. wide; flowers pale blue — 2. L. spicata

    4 Achenes narrowed into a slender beak 1.5 mm. 8 long upon which the pappus is borne; terminal lobes of the leaves narrowly lanceolate, commonly 5-6 mm. wide; flowers yellow — 3. L. canadensis

0 Leaves not clasping the stem or but little, mostly 4 narrowed toward the base — 4. L. pulchella

1. L. Scariola var. integrata Gren. & Godr. Prickly Lettuce. An erect biennial or annual 1-3 m. tall, glabrous and glaucous throughout, the stems armed in the lower parts with short prickles; leaves entire or somewhat cleft, 5-12 cm. long, the lower oblanceolate, the upper oblong, all sessile and somewhat clasping, erect, the margins and midribs beneath armed with sharp small prickles; ~~inflorescence~~ graceful panicle 30-60 cm. long with widely spreading slender almost naked branches bearing small bracts 2-3 mm. long; heads narrowly oblong, borne on very slender peduncles, 6-7 mm. long in flower, increasing to 10-12 mm. in fruit, the involucral ~~consisting of 3-4 series of unequal lanceolate or linear-lanceolate membranous~~ bracts with narrow scarious margins; corollas yellowish, becoming bluish; achenes 3 mm. long, mostly 5-ribbed on each face, tapering into a hair-like beak as long as or longer than the body; pappus white.

tr

Frequent in dry waste places; introduced from Europe.

(2.) L. spicata (Lam.) Hitch. → An erect glabrous biennial 1-3 m. tall branching only in the inflorescence, the stems more or less glaucous; leaves pale, numerous, the lowermost soon withering, oblanceolate in outline, 15-25 cm. long, narrowed to petioles 5-6 cm. long, the terminal lobe deltoid, 4-6 cm. wide, the angles acute, the lateral lobes 4-6, irregular, mostly oblong, the margins of all acutely sinuate-dentate, the upper leaves sessile, similar, but more elliptical or oblong in outline, the lobes more deltoid; ~~inflorescence~~ → narrow panicle, 20-40 cm. long, its branches 2-5 cm. long, ascending; heads numerous, constricted above the middle, about 1 cm. tall, ~~their involucres consisting of several series of unequal lanceolate herbaceous bracts~~; corollas whitish or lilac, subequal to the involucre; achenes 4-4.5 mm. long, tapering to a short neck, but scarcely beaked, 3-4-ribbed on the sides, the pappus buff-colored.

Frequent in moist or swampy ground in low open woods or at the margins of woods.

(3.) L. canadensis L. → Perennial herbs 60-200 cm. tall or more, the lower leaves oblanceolate, tapering to an indefinite petiole, the upper lanceolate or elliptical, sessile and clasping, with short acute auricles, all 10-20 cm. long, 4-6 cm. wide, deeply pinnatifid into 3-6 pairs of spreading very acute lobes 8-15 mm. broad, these again sharply toothed on the upper edge or entire, the terminal lobe linear-lanceolate, 5-6 mm. wide, very acute; ~~inflorescence~~ → narrowly ovoid panicle 6-20 cm. long, its branches ascending, frequently shortened, the inflorescence then compact; heads numerous, their involucres 10-12 mm. tall, consisting of 3-4 series of lanceolate bracts; flowers pale yellow; achenes blackish, 3.5 mm. long, elliptical, 1-3 ribbed, tapering into a slender beak 1.5 mm. long.

tr

Frequent in dry burns in the northern part of our region.

(4.) L. pulchella (Pursh) DC. → An erect perennial 60-90 cm. tall, glabrous and glaucous throughout, the basal leaves narrowly oblanceolate, 12-15 cm. long, acute, tapering to an obscure winged petiole, more or less sinuately lobed, the upper very narrowly elliptical or linear, entire or nearly so; ~~inflorescence a more or less~~ → ovoid panicle, 15-20 cm. long, the branches ascending, 5-6 cm. long; heads not numerous, their involucres 12-15 mm. tall, ~~consisting of several series of erect, lanceolate bracts~~; corollas blue or violescent, 2 cm. long; achenes 4 mm. long, tapering to a short neck, 3-ribbed on both faces.

Occasional in dry waste places and along roadways. →

no H → Wallace, Flint and Jones 1936.

## 6. Sonchus (Tourn.)L. Sow-Thistle.

Coarse herbs with leafy stems and abundant milky juice. Heads cymose or umbellate, their involucres deeply campanulate, the bracts unequal, herbaceous; receptacle naked. Flowers yellowish. Achenes strongly flattened, ribbed on the faces, blunt, not beaked; pappus of soft white bristles.

0 Involucral bracts 15-18 mm. long; marginal teeth of leaves
4 rarely 2 mm. long; perennial — 1. S. arvensis

0 Involucral bracts 10-15 mm. long; marginal teeth
4 mostly 2-4 mm. long or more; annuals

2 Basal leaves mostly unlobed, oblanceolate,
6 spatulate or obovate; herbage very prickly — 2. S. asper

2 Basal leaves lyrate, the terminal lobe much
6 larger than the laterals, the rachis nearly (t)
naked below the laterals; herbage not markedly
prickly — (3.) 3. S. oleraceus

1. S. arvensis L. → Weedy perennial herbs 40-100 cm. tall or more, glabrous and somewhat glaucous, the lower leaves mostly oblanceolate, narrowed to indefinite petioles, somewhat sinuate but mostly unlobed and finely denticulate with very sharp teeth, the stem leaves oblanceolate or narrowly elliptical in outline, sessile, clasping at the base, irregularly pinnatifid into subdeltoid spreading lobes the margins very sharply toothed but hardly subspinose, the teeth rarely 2 mm. tall, tipped with a weak prickle; heads subumbellate, but few and panicled, inflorescence usually glandular with conspicuous capitate glands; bracts 15-18 mm. long, lanceolate, acute, glandular; corollas yellow, 20-22 mm. long; achenes 2 mm. long, ribbed longitudinally and transversely wrinkled.

Occasional as a weed in waste places.

(2.) S. asper (L.) All. → Weedy annual herbs 80-150 cm. tall or more, glabrous and glaucous with prickly herbage, the lower leaves obovate to spatulate, narrowed to indefinite petioles, sharply dentate, hardly lobed, the teeth tipped with spines, the upper leaves oblanceolate to oblong, sessile and clasping at the base, more or less triangular at the apex, pinnately and irregularly lobed, the lobes more or less deltoid, the margins spinose-dentate with teeth 2-4 mm. tall; inflorescence glandular with conspicuous stalked glands, formed of a series of panicled, ample, umbels; heads ovoid in flower, hemispherical in fruit, their involucres 10-15 mm. tall; flowers yellow; achenes strongly flattened, elliptical, 3-ribbed, 2-2.5 mm. long.

Occasional as a weed in waste places and on newly surfaced ground. →

no H → Lamb Creek, Epling and Houck 10255.

(3.) S. oleraceus L. → Weedy annual herbs 60-100 cm. tall or more, their basal leaves prevailingly lyrate, the terminal segment very much larger than the one or two pairs of lateral segments, deltoid but with convex margins, the lower stem leaves similar, the terminal segment more angular, the lateral segments better developed, soon passing into oblanceolate, pinnatifid leaves with acute deltoid lobes, these in turn passing into oblong or lanceolate, merely toothed leaves, the stem leaves mostly sessile and clasping with rounded auricles, the margins of all sharply toothed with triangular very sharp but hardly spinose teeth 2-4 mm. tall or more; heads in irregular umbels which are usually glabrous; bracts 10-12 mm. long, lanceolate, acute; corollas yellow, 15 mm. long; achenes scarcely 3 mm. long, somewhat pappilose.

Occasional as a weed in waste places.

## 7. Tragopogon (Tourn.)L.

Cqa. ~~Perennial~~ herbs with fleshy taproots and alternate linear leaves. Heads upon elongate peduncles, their involucres cylindrical, becoming funnel-shaped, formed of a single series of herbaceous bracts; receptacle naked. Corollas purple. Achenes spindle-shaped, ~~attenuate into a slender~~ beaked, ~~beak as long as the body bearing at its apex the plumose pappus~~ the pappus plumose.

1. T. porrifolius L. → Salsify. Glabrous and rather glaucous biennials, branching, 60-90 cm. tall or more; leaves linear-lanceolate, expanded at the base, attenuate towards the apex, 10-25 cm. long; heads borne on stout peduncles which are dilated toward the apex, the bracts linear-lanceolate, 3-4 cm. long; corollas purple, 30-35 mm. long; achenes forming at maturity a globose cluster 5-6 cm. in diameter, the body of the outer achenes roughened, those of the inner smooth, 9-11 mm. long, attenuate to a beak of equal length, the pappus brownish, softly plumose.

Locally abundant along roadways and in waste places; escaped from cultivation; native of Mediterranean region.

## 8. Hieracium (Tourn.) L. Hawkweed.

Perennial erect herbs with milky juice, ~~and~~ alternate leaves and pubescent herbage. ~~bearing either minute branched hairs or coarse elongated hairs which are swollen at the base and minutely barbed or both.~~ Heads few or numerous, ~~displayed~~ in simple cymes or cymose panicles, their involucres bell-shaped, consisting of 2-5 unequal series of narrowly lanceolate membranous bracts; receptacle flat, naked. Flowers yellow, or in one species white. Achenes mahogany-brown or nearly black, columnar, truncate, longitudinally ribbed, the pappus of 1-2 series of tan or buff-color bristles, soft and fragile.

0 Stems 15-30 cm. tall, very slender, bearing 1-2 linear
4 bracts, the leaves basal — 1. H. gracile

0 Stems 30-90 cm. tall, leafy, the leaves diminished in
4 size higher on the stem

2 Involucral bracts essentially glabrous

4 Flowers white or whitish; bracts in usually
8 2 series; leaves thinly hirsute on both surfaces — 2. H. albiflorum

4 Flowers bright yellow; bracts in 3-5 series;
8 leaves glabrous above, the lower surface thinly pubescent with branched hairs — 3. H. canadense

2 Involucral bracts bearing either stalked glands
6 or long coarse hairs which are minutely barbed, or both

4 Bracts bearing stalked glands but few or no
8 longer hairs — 4. H. cynoglossoides

4 Bracts bearing long coarse hairs and frequently
8 glands as well

6 Entire plant especially the bracts hoary with
10 coarse hairs — 5. H. albertinum

6 Herbage and bracts thinly hirsute, the stems
10 glabrate — 6. H. Cusickii

1. H. gracile Hook. → Small graceful perennials 15-30 cm. tall, the stems often 2 or 3 from the same basal tuft, slender, sparingly pubescent with branching hairs, nearly naked, bearing one or two linear bracts or rarely with a reduced leaf near the base; leaves of the basal tuft 3-7 cm. long, oblanceolate or spatulate, or tapering to indefinite petioles, frequently with nearly elliptical blades acutely narrowed to slender petioles of equal length, entire, for the most part nearly or quite glabrous, the stem leaves much smaller, bract-like; heads sometimes solitary and terminal, commonly 4-6 in a simple often one-sided cyme, the branches of which bear stalked glands towards the tips; involucres bell-shaped, consisting of 2 series of bracts, the inner of which are 7-8 mm. long, sparingly pubescent with small branched white hairs, bearing also stalked glands and longer slender black hairs; flowers yellow; achenes 2.5 mm. long.

Common in thin soil on rounded mountain tops and ridges at high elevations.

2. H. albiflorum Hook. → Perennial herbs with stout rootstocks, for the most part 30-60 cm. tall, ~~rarely as much as 80 cm.~~ thinly retrorsely hirsute toward the base, glaucous for the rest, ~~rarely glaucous throughout,~~ the stems commonly scapose, bearing 3-5 reduced leaves ~~, rarely in vigorous specimens leafy to or into the inflorescence~~; basal leaves oblanceolate, mostly obtuse, 4-8 cm. long or as much as 20 cm. in robust plants, sparingly sinuate-denticulate or entire, all thinly hirsute on both surfaces, the lower surface pale; the lower stem leaves similar but smaller, becoming oblong or elliptical, acute, sessile and glaucous higher on the stems; branches of the inflorescence slender, ascending, often glandular, the heads ~~rarely strictly racemose in small speciments, prevailingly~~ in diffuse cymose panicles, these sometimes ample ~~in vigorous specimens~~, 30-40 cm. long; involucres bell-shaped, consisting of 2 series of unequal narrowly lanceolate, acute bracts, the inner 7-8 mm. long, increasing in age to 10 mm., glabrous or ~~sparingly provided~~ with a few fleshy hairs, sometimes thinly glandular towards the base; flowers white; achenes mahogany color, 2.5-2.8 mm. long. =/

Common throughout our region at lower elevations in burns or on stony outcrops, less often in thin woods.

③ H. canadense var. columbianum (Rydb.) Piper. → Perennial herbs 30-90 cm. tall, the stems commonly decumbent, thinly pubescent with branched hairs, especially in the inflorescence, the lowermost internodes hirsute; lowermost leaves oblanceolate or even spatulate, tapering to an indefinite petiole, subentire, 5-10 cm. long, the lower or median leaves oblong or elliptical, 2-15 cm. long, acute at both ends, sharply and remotely toothed, the teeth .5-2 mm. tall, passing into the lanceolate, very acute and quickly diminished upper leaves which are sessile and narrowed toward the base, but somewhat rounded, all paler and sparingly pubescent on the lower surfaces with branched hairs, the lowermost thinly hirsute with hairs similar to those on the stems; heads numerous and showy in robust individuals, in cymose panicles 25-30 cm. long, the branches of which are rather widely ascendant; involucres of 3-5 series of unequal narrowly lanceolate glabrous bracts, the inner of which are 8-9 mm. long; flowers bright yellow, their corollas 10-12 mm. long; the tube usually thinly villous; achenes 2.7-3.2 mm. long.

Frequent in the northern part of our region at lower elevations, less so in the south, occurring in moist ground, often times on ledges near water. Priest R. Valley is the type locality for this variety (MacDougal 109).

subsp. → ~~var.~~ scabriusculum (Schwein.) Epling. Similar in every way to var. columbianum except in the absence of the coarse hairs at the base of the stem and the presence of minute conical hairs in the inflorescence and upon the leaves, making them rough. (H. scabruisculum Schwein.). —With var. columbianum.

4. H. cynoglossoides Arvet-Touvet. → this A perennial herb 30-50 cm. tall, yellowish-hirsute below the inflorescence, ~~these being~~ glandular with blackish hairs; basal leaves oblanceolate or ligulate, 12-15 cm. long, tapering to indefinite petioles, mostly obtuse, entire, hirsute on both surfaces especially along the veins beneath, the lower stem leaves similar, more acute, smaller, the upper leaves reduced, often lanceolate, often glabrate; heads few in simple cymes, the peduncles being glandular with stalked glands; involucres consisting of 2 series of unequal lanceolate bracts, the inner 7-8 mm. long, densely glandular with short black stalked glands, not at all hirsute; flowers yellow, their corollas 7-8 mm. long; achenes not seen.

3-Link Creek, Shattuck and Fenn.

5. H. albertinum Farr. → Perennial herbs 30-60 cm. tall, the stems hoary-hirsute with coarse hairs, and minutely glandular above, more or less leafy throughout, the basal leaves narrowly oblanceolate, 10-15 cm. long, 8-15 mm. wide, prevailingly acute, gradually narrowed to indefinite petioles, entire or remotely and shallowly denticulate, coarsely hoary-hirsute, ~~the hairs sometimes with blackish bases,~~ the stem leaves similar, ~~gradually reduced upwards,~~ the uppermost sessile, linear-lanceolate; heads in ~~rather crowded cymes, these commonly~~ a convex cluster, frequently elongating to ovoid, the branches hirsute with spreading hairs and somewhat glandular ~~with small stalked glands~~; involucres densely hoary-hirsute, the bracts frequently bearing also small stalked glands, linear-lanceolate, the inner series 9-10 mm. long; achenes 3-3.2 mm. long.

Common in dry burns and on rocky outcrops throughout our region.

6. Cap. H. cusickii Gdgr. → Perennial herbs 40-60 cm. tall, the stems slender, thinly hirsute with coarse hairs ~~which are often black at the base~~, or glabrate; basal leaves oblanceolate, 8-10 cm. long, mostly obtuse, narrowed to indefinite petioles, entire, coarsely but thinly hirsute, the lower stem leaves similar, becoming oblong-lanceolate and reduced in size higher on the stem, sessile and more or less acute and less hairy; heads in compound often one-sided cymes, the branches ~~of which are~~ sparingly glandular with short stalked glands; involucres consisting of 2 unequal series of narrowly lanceolate or linear bracts, the inner 6-10 mm. tall, all sparingly hirsute with slender blackish hairs and glandular with small glands; flowers yellow, their corollas 9-12 mm. long; achenes 2.8-3.0 mm. long. (H. griseum Rydb. not ~~Formanek~~) Formanek). =/

Frequent in burns or on stony outcrops. This species and the two following, namely H. cynoglossoides and H. albertinum are very closely allied to each other and to H. Scouleri, ~~and not improbably represent incipient species of a variable complex.~~

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Crepis barbigera Leiberg is occasionally found in dry marginal situations. Of the general habit of Hieracium, it may be readily recognized by the conspicuous bristle-like yellow hairs on the involucral bracts and by the tapering achenes.

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## 9. Prenanthes Vaill.

Glabrous perennial herbs with milky juice and alternate leaves. Heads few, nodding in flower, entirely radiate, their involucres top-shaped, consisting of 2 series of equal bracts with a few smaller at the base forming a third series; receptacle flat, naked. Flowers whitish, tinged with purple. Achenes columnar, longitudinally ribbed; pappus of soft but rather rigid bristles.

1. P. hastata (Less.) M.E. Jones var. sagittata (Gray) M.E. Jones.
Cap ~~Glabrous smooth perennials, their~~ stems 20-60 cm. tall; leaves hastate, the blades 5-10 cm. long, 2.5-5 cm. wide, acuminate at the apex, the basal lobes acute or acuminate, spreading or decurved, the margins sharply and coarsely but irregularly toothed with deltoid teeth, borne on winged petioles 3-5 cm. long, the uppermost stem leaves passing into the attenuate bracts of the inflorescence; heads in simple racemes 15-25 cm. long or the lowermost 2-3 on short axillary branches, nodding in flower, erect in fruit, their involucres 10 mm. tall, the outermost bracts less than half as long as the inner series, the inner narrowly oblong, obtuse, thinly herbaceous; corollas
d dull white, tinged with violet or lavender, 15-16 mm. long, the limbs oblong, 5-toothed at the apex; achenes 4-4.5 mm. long, the pappus buff-colored, 8-9 mm. long.

Frequent in rock crevices or in rocky ground at the margins of wooded streams at lower elevations.

## Tribe Eupatorieae

→ Our only genus is the following:

### 10. Brickellia Ell.

Perennial herbs with opposite and alternate leaves on the same individual. Heads bell-shaped, without ray flowers, racemose or more commonly panicled, their involucres of several series of dissimilar herbaceous or somewhat chaffy bracts which are strongly veined with parallel veins. ~~the outer attenuate, the inner blunt.~~ Corollas whitish. Receptacle flat, naked. Achenes columnar, 10-ribbed. Pappus a single series of capillary scabrous bristles.

1. B. grandiflora (Hook.) Nutt. → Perennial herbs with rather slender erect stems 60-80 cm. tall, puberulent, arising from a short crown with elongate roots; ~~leaves opposite or alternate, their~~ leaf-blades deltoid-ovate, 3-6 cm. long, acute, truncate or subcordate at the base, sharply toothed, puberulent at least on the veins; ~~abruptly narrowed to slender~~ petioles .5-2.5 cm. long; heads few in a terminal raceme or more commonly several at the tips of axillary peduncles 3-5 cm. long, ~~this forming loose panicles,~~ the primary peduncles .5-1 cm. long, puberulent; bracts in 4-5 series, the outermost broadly ovate, abruptly attenuate, the inner linear-oblong, 8-10 mm. long, chaffy, obtuse, ~~strongly parallel veined with~~ membranous and ciliate margins; corollas 7 mm. long; achenes 3.5 mm. long, scabrous, somewhat flattened. =/

Granite ledges near s. end Lake Pend Oreille, Sandberg 749.

## Tribe Astereae.

Herbs with alternate leaves. Bracts of the involucre herbaceous, commonly lanceolate, for the most part in several series, overlapping; receptacles flat or convex, naked. Ray flowers present. ~~Pappus in *Grindelia* of two membranous easily deciduous awns, for the rest of capillary bristles.~~ Pappus of capillary bristles (in *Grindelia* of 2 membranous readily deciduous awns).

## 11. Grindelia Willd.

Biennial or perennial herbs with alternate sessile rather glutinous leaves. Heads numerous, their involucres compact, hemispheric, glutinous, consisting of several series of subulate, overlapping bracts which are closely appressed at the base, recurving at the tips, the receptacle flat or convex, pitted, naked. Ray-corollas slender, yellow; disc corollas yellow. Achenes 4-5-ribbed, flattened ovoid, truncate at the apex but bearing two acicular easily deciduous awns.

var. serrulata (Rydb.) Steyerm. Gumweed.

J

Cap. 1. G. squarrosa (Pursh) Dunal. ~~Rather woody glutinous herbs,~~ ~~branching at the base, the~~ stems ascending 30-50 cm. tall; leaves rather leathery, ~~alternate,~~ the basal ones oblanceolate, the cauline oval or oblong, 1.5-3 cm. long, obtuse, sharply serrate, both surfaces glabrous and sticky; involucres 12-15 mm. wide, sticky, the bracts 4-6 mm. long; ray flowers 7-9 mm. long, disc-flowers 4 mm. long; pappus slender, even, as long as the disc-flowers; achenes straw-color, 2 mm. long.

Occasional in dry soil at low elevations. →

no H → Lake Coeur d'Alene , Epling and Houck 10032.

## 12. Aplopappus H. Cass.

Erect perennial herbs with leafy stems and entire or small-toothed alternate leaves. Heads radiate, solitary or borne in narrow racemes; involucre of several series of herbaceous or submembranous oblong-lanceolate overlapping bracts; receptacle flat. Flowers yellow. Achenes subcylindrical, more or less ribbed; pappus of capillary bristles. (Haplopappus) ~~the aspirated~~ form of ~~generic name)~~.

Tufted plants 5-15 cm. tall; bracts herbaceous and commonly tinged with purple, acute — 1. A. ~~H.~~ Lyallii

Erect plants 30-50 cm. tall; bracts firm, the outer subfoliar, all rounded at the apex and mucronate — 2. A. ~~H.~~ carthamoides

Ⓐ

1. H. Lyallii Gray. → A diminutive perennial 5-15 cm. tall, the leaves entire, oblanceolate, the basal ones tufted, 1.5-2.5 cm. long, attenuate towards the base, the cauline similar but more oblong-lanceolate and usually larger, all usually mucronate or abruptly acuminate at the apex, glandular-pubescent on both surfaces; heads solitary, terminating erect or ascending leafy glandular stems or sometimes two; bracts of the involucre often reddish, in 3-4 series, membranous, at least the margins of the innermost scarious, all oblong-lanceolate, acute, glandular 8-10 mm. long; ray-flowers yellow, about twice as long as the bracts; mature achenes not seen. (Tonestus Lyallii A. Nels.).

In rock crevices on the high peaks of the north.

Ⓐ

2. H. carthamoides (Hook.) Gray ~~var. rigida~~ subsp. rigidus (Rydb.) Hall. → Perennials with stout roots; basal leaves oblanceolate, 10-15 cm. long, mostly obtuse, attenuate to an indefinite petiole, thinly villous ~~when young,~~ becoming glabrous and leathery, the stem leaves ~~similar, but smaller~~ sessile and less attenuate below the middle, all entire; heads terminal and solitary or few in a raceme, sessile, their involucral bracts in several densely overlapping series, the outermost subfoliar, puberulent and ciliate, obovate to oblong, 10-20 mm. long, acuminate, the inner series oblong, thinner, rounded at the apex but mucronate, their margins somewhat uneven; ray-flowers scarcely exceeding the bracts; achenes 6 mm. long, narrowed at the apex to a short beak, the pappus spreading and stiffish. (Pyrrocoma rigida Rydb.).

In dry gravelly soil at low elevations in association with yellow or lodge-pole pine. Granite Sta., Kootenai Co., is the type locality of this subspecies (Sandberg et al. 785).

## 13. Chrysopsis Nutt.

Perennial branching herbs with alternate entire leaves. Heads numerous, showy. Involucres consisting of about 3 series of ~~linear-oblong or linear-~~ ~~lanceolate~~ stiffish bracts, the receptacles flat or convex, pitted, naked. Ray-flowers yellow, fertile; disc-flowers yellow. Achenes flattened, oblanceolate in outline, the pappus consisting of two unequal series of scabrous bristles, the inner several times as long as the outer.

1. C. villosa (Pursh.) Nutt. Golden Aster Low ashy perennials 20-40 cm. tall with stout roots and commonly branching caudices, the stems several, ascending, rough-hairy; leaves numerous, oblanceolate, sessile, 1.5-4 cm. long, entire, rough on both surfaces; heads in corymbs on slender leafy peduncles 1-3 cm. long, their involucres hemispherical, the bracts linear-oblong, the longest 4-6 mm. long, all ashy with appressed stiffish hairs; ray-corollas 1 cm. long, slender, the disc-corollas scarcely half as long; achenes 1 mm. long, hirsute, the inner series of pappus bristles 6-7 mm. long.

Occasional in dry ground at low elevations.

no H **Moyie Springs; Bonner's Ferry; Lake Pend Orielle; Clark's Fork Valley, 2133 ft.**

## 14. Solidago L. Goldenrod.

Erect perennial leafy herbs with horizontal rootstocks and alternate crowded leaves. Heads usually numerous, small, their involucres formed of 3-4 series of unequal erect narrowly lanceolate chaffy bracts, the receptacle convex, naked or minutely pubescent. Ray-flowers pistillate, their corollas yellow, the limbs narrowly oval or elliptical; disc-flowers yellow. Achenes cylindrical, slightly narrowed at both ends, usually 8-ribbed, hispid or hirtellous.

0 Low perennials, the stems 5-25 cm. tall, the heads
4 usually less than 20 — 1. S. ciliosa

0 Erect perennials with virgate stems 30-120 cm. tall

2 Panicles loose, formed of several corymbose clusters;
6 achenes hispid with stiff hairs; receptacle
6 pubescent — 2. S. occidentalis

2 Panicles dense, rhombic, ovoid or pyramidal, the flow-
6 ers crowded along the branches

4 Stem leaves mostly 1-1.5 cm. broad, sharply
8 serrulate

6 Branches of the panicle strictly ascending — 3. S. elongata

6 Branches of the panicle recurving and
10 drooping — 4. S. serotina

4 Stem leaves quickly diminished, 1.5-5 cm.
8 long, 2-6 mm. broad, entire or nearly so — 5. S. missouriensis

(1.) S. ciliosa Greene. → Low perennials with horizontal rootstocks, the stems solitary, ascending, 5-25 cm. tall, sparingly pubescent; basal leaves spatulate or obovate, the earliest 4-5 mm. long, the later ones 2-3 cm. long, 8-12 mm. wide, all more or less dentate, ~~at least towards the apex~~ the lower cauline leaves mostly oblanceolate, obtuse, usually entire, the upper narrowly elliptical, sessile, much reduced, acute, all prominently net-veined, ciliate on the margins at least in the lower half and on the petioles; heads in a usually dense or sometimes somewhat loose panicle or raceme 2-8 cm. long, depending upon the vigor of the plant, the branches ~~of which are~~ sparingly glandular; heads rarely more than 20; ~~their~~ involucral bracts 2.5-5 mm. long, oblong-lanceolate, acute, the midveins prominent; ray-flowers about 15, their corollas 5 mm. long; achenes 2 mm. long, 8-ribbed, sparingly hirtellous.

In rocky but moist places at high elevations.

(2.) # S. occidentalis (Nutt.) T. & G. An erect glabrous perennial herb with elongated rootstocks, the stems 80-150 cm. tall; very leafy, the leaves linear, entire, 3-veined, 3-10 cm. long, 2.5-8 mm. wide, sessile, narrowed at both ends, acute; inflorescence a loose panicle 30-60 cm. long, composed of several corymbs at the tips of its slender ascending branches; heads numerous, their involucral bracts 2-4 mm. long, lanceolate or oblong-lanceolate, acute, 1-veined, the margins scarious; ray-flowers 16-20, their corollas 3-4 mm. long, achenes hispid with rigid hairs.

Frequent in moist ground along banks of slower streams at low elevations.

(3.) S. elongata Nutt. ~~Erect perennial~~ Herbs with virgate stems 30-80 cm. tall or more from horizontal rootstocks, sparingly pubescent with small curving hairs, especially above; leaves numerous, ascending, the lowermost oblanceolate, narrowed to indistinct petioles, 5-15 cm. long, the upper oblanceolate, narrowly elliptical higher on the stem, sessile, all sharply but remotely toothed or entire, acute at both ends, rough-hairy on the edges and midvein beneath, otherwise glabrous; heads very numerous, usually in a narrow rhomboidal or elliptical panicle 10-30 cm. long, this frequently pyramidal or even corymbose, the branches always ascendant or nearly erect, their involucral bracts 1.5-3.5 mm. long, narrowly lanceolate, acute, the midveins prominent; ray-flowers 12-18, their corollas 3.5-4.5 mm. long; achenes scarcely 2 mm. long, hirtellous.

Frequent in dry burns and in dry soil throughout our region.

(4.) S. serotina Ait. var. salebrosa Piper. → Perennial herbs with elongate rootstocks, the stems erect, 60-120 cm. tall, virgate, puberulent with minute curved hairs especially in the upper parts, or minutely glandular, more or less glaucous; basal leaves oblanceolate, soon withering, the stem leaves ascending 6-12 cm. long, narrowly elliptical or oblanceolate, sessile, acute at both ends, sharply toothed, the teeth salient, rough-hairy on the margins and veins beneath, otherwise glabrous; heads very numerous and crowded in showy pyramidal or ovoid panicles 20-40 cm. long, the branches of which recurve and droop, their involucral bracts narrowly lanceolate, acute, 2-4.5 mm. long, sparingly and minutely hirtellous; ray-flowers 7-14, their corollas 3.5-4 mm. long; achenes 1.5 mm. long, narrowed slightly at both ends, 8-ribbed, sparingly hirtellous.

Common in burns and meadows and along streams.

5. S. missouriensis ~~Gray~~ Nutt. Perennial herbs with matted, branching rootstocks and tufted stems 30-60 cm. tall, glabrous or nearly so, the basal leaves 6-15 cm. long, oblanceolate or spatulate, attenuate to indefinite petioles, mostly acute at the apex, glabrate, the lower stem leaves similar but smaller and more narrow, the upper linear or linear-oblanceolate, sessile, very acute, commonly folded inward, all more or less roughened on the margins with small curving hairs; heads in dense pyramidal panicles 5-8 cm. tall, the lower branches ~~of which are~~ recurved; heads numerous, their involucral bracts 2-5 mm. tall, oblong-lanceolate, acutish or obtuse, dull, the midvein prominent in all, yellowish-green, the margins, especially of the inner, scarious, usually ciliolate; ray-flowers 8-12, their corollas 4 mm. long; mature achenes not seen.

Frequent on open hillsides at lower elevations.

## 15. Aster (Tourn.) L. Aster

Perennial herbs with horizontal rootstocks or rarely with a branching caudex and leafy stems, the leaves alternate, the basal ones mostly oblanceolate or spatulate, passing into the sessile linear, elliptical or oblong usually-clasping stem leaves. Heads commonly corymbose, frequently in elongate panicles, their involucral bracts mostly in several series, the outer wholly herbaceous, frequently subfoliar, the inner commonly with herbaceous tips, more or less chaffy below, or all with herbaceous tips; receptacle naked. Ray-flowers pistillate, commonly violet-blue or lavender, less often rose-purple or white, their limbs mostly more than 1 mm. wide. Disc-flowers perfect, yellowish, becoming more or less tinged with purple or blue. Achenes wedge-shaped or oblanceolate, more or less flattened, smooth or ribbed; pappus a single series of slender barbed bristles.

0 1a. Bracts and branches of inflorescence glandular with short-stalked
4 glands
2 Bracts only glandular, not ciliate with soft hairs
4 Upper surfaces of leaves scabrous with short
sharp hairs; upper stem leaves prevailingly
8 elliptical, distinctly narrowed both ways
from the middle, some usually toothed above
the middle 1. A. modestus
4 Upper surfaces of leaves glabrous or thinly pubescent
with spreading hairs, the upper stem leaves
8 prevailingly entire, oblong, commonly broadest
near the base, or if somewhat broader near the
middle, somewhat concave below 2. A. integrifolius
2 Bracts sparingly glandular on the backs, their margins
6 ciliate with soft hairs 3. A. conspicuus

0 1b. Bracts not glandular but glabrous or ciliate, less often pubescent

2 Involucral bracts 1.5-3 mm. long; ray corollas 6 mm.
6 long 4. A. multiflorus

2 Involucral bracts 4-8 mm. long or more; ray-corollas
6 8-15 mm. long or more

4 2a. Leaves linear or linear-oblanceolate, oblanceolate-oblong
8 in one species, 2-10 mm. wide, some rarely 12-15
mm. wide

6 Ray-corollas 20-25 mm. long; tufted herbs with
10 several ascending stems 5. A. stenomeres

6 Ray-corollas 8-14 mm. long; erect, leafy, slender=1
10 stemmed herbs

8 Leaves pubescent on the lower surfaces,
12 oblanceolate or oblong 6. A. meritus

8 Leaves glabrous, mostly linear

10 Leaves more or less serrate

12 Leaves 2-3 mm. wide, 1-3 cm. long 7. A. Hallii

12 Leaves 3-15 mm. wide, 3-15 cm. long 8. A. Douglasii

10 Leaves entire

12 Outer involucral bracts obtuse, somewhat
16 mucronate 9. A. Eatoni

12 Outer involucral bracts
16 awl-shaped 10. A. Frankliniamus

4 2b. Leaves oblong or oblong-elliptical or elliptical, the lower
8 oblanceolate, commonly 15-30 mm. broad, the broadest
rarely as narrow as 10 mm. or as broad as 50 mm.

6 Leaves prevailingly elliptical, acute at both ends,
10 not at all expanded and clasping at the
base 11. A. Engelmannii

6 Leaves oblanceolate in the lower parts, in the upper
10 oblong or oblong-elliptical, rounded truncate and
more or less clasping at the base

8 Leaves of the branchlets abruptly and strongly
12 reduced, 1-2 cm. long or less; stems
glabrous and glaucous throughout 12. A. laevis

8 Leaves of the branchlets gradually reduced,
12 infrequently less than 2 cm. long;
stems more or less pubescent

10 Leaves (at least the upper) softly woolly on
14 the lower surfaces especially along the
veins; bracts pubescent 13. A. Cusickii

10 Leaves glabrous; bracts ciliolate on the
14 margins

12 Bracts subequal, 5-8 mm. long, an
16 occasional one rarely more; the
clasping base of the upper leaves
5-8, rarely 10 mm. wide; ray corollas
10-15 mm. long

14 Plants prevailingly 60-80 cm. tall;
18 middle leaves rarely less than 1
cm. wide, tending to elliptical
14. A. foliaceous

14 Plants prevailingly 30-60 cm. tall; middle
18 leaves rarely more than 1 cm. wide,
tending to linear-oblong 15. A. Fremontii

12 Bracts unequal, the outer 8-10 mm. long with one
16 or two commonly longer, as much as 2.5
cm. long and 3-4 mm. wide; the clasping
base of the upper leaves rarely less than
10 mm. wide; ray-corollas 15-25 mm.
long 16. A. Canbyi

① A. modestus Lindl. → Herbs with horizontal rootstocks, the stems 40-100 cm. tall, branching towards the apex, densely glandular with stout short glands in the upper parts, more or less villous with slender hairs in the lower; ~~the~~ basal leaves oblanceolate, soon withering, the stem leaves prevailingly oblong-elliptical, 5-15 cm. long, 8-25 mm. broad, usually tapering lightly both ways from the middle but rounded at the base, sessile and clasping, acuminate at the apex, some usually entire, some sparingly and remotely toothed above the middle, the teeth salient and acute, their upper surfaces scabrous with short sharp hairs, the lower thinly villous, the upper leaves glandular as well, those of the inflorescence chiefly glandular ~~alone~~ only; involucral bracts 6-8 mm. long, the outer green, linear-oblong, the inner linear-lanceolate, acute, commonly thinner and purplish, all glandular; ray-corollas reddish-purple, 10-12 mm. long, 1.5 mm. wide; achenes 2.5-3 mm. long, hirtellous, ribbed.

Common throughout our region at low elevations in meadows, along streams or in burns; rarely above 4000 ft.

2. A. integrifolius Nutt. → Herbs with horizontal rootstocks, the stems 40-60 cm. tall, branching towards the apex, densely glandular and villous above, glabrous in the lower parts; basal leaves narrowly oblanceolate, 10-15 cm. long, more or less acute, passing into leaves which are similar but more acute above, those above the middle of the stem prevailingly oblong, tapering toward the apex and acute, rounded to truncate and clasping at the base, all entire, glabrous on both surfaces or the upper surface thinly pubescent with spreading hairs or those toward the inflorescence both glandular and somewhat pubescent, none scabrous with short sharp hairs; heads in more or less ovoid panicles, their involucral bracts linear-oblong, tapering somewhat and acute, the inner 7-9 mm. long, usually purplish, all glandular; ray corollas reddish-purple, 15-16 mm. long, 2-2.5 mm. wide; achenes 4.5-5 mm. long, hirtellous. =/

Open moist woods →

Scurvy Mt., 6000 ft., Kirkwood 1944; near Elk Summit (Selway Forest), 5000 ft., Kirkwood 1686.

(3.) A. conspicuus Lindl. → Herbs with slender creeping rootstocks, stems commonly solitary, 40-90 cm. tall, glandular-puberulent except towards the base, thinly villous there or occasionally throughout; leaves somewhat firm and leathery, the basal ones oblanceolate, soon withering, the stem leaves prevailingly obovate-elliptical, 5-15 cm. long, 2-6 cm. wide, usually somewhat wider above the middle, acute or acuminate, narrowed toward the base but the upper at least rounded at the very base, all sessile and sharply serrate, the teeth 1.5-4 mm. long, salient, scabrous above, glabrous beneath; heads rather showy in terminal more or less flat-topped clusters, the branches usually arcuate-ascending, bearing small bracts; involucral bracts in several unequal series, 4-8 mm. long, lanceolate, glandular, ciliate, acute; ray-corollas violet, 16-20 mm. long, 1.5-2.5 mm. wide; achenes hirtellous.

**Common throughout our region on thinly wooded hills or mountain sides, or sometimes in burns.**

(4.) A. multiflorus (Ait.) var. pansus Blake. Stems 50-70 cm. tall, ascending, spreading-hirsute, much branched; leaves linear, those below 3-5 cm. long, 3-4 mm. wide, those above 1 cm. long or less, 1-2 mm. wide, all sessile, entire, numerous smaller ones clustered in the axils; all more or less rough-hairy; heads very many, crowded along the branches; #
involucral bracts 1.5-3 mm. long, oblong, the outer ones somewhat expanded at the tips, blunt, the inner acute, all hispidulous; ray-corollas 6 mm. long, oblanceolate, blunt, white; achenes 1.5 mm. long.

Dry hillsides under Yellow Pine, Bonners Ferry, [illegible].

up (5.) A. stenomeres Gray ~~Perennial~~ tufted herbs with several stems ascending from a branching caudex, 25-40 cm. tall, thinly villous; leaves linear, 1.5-3 cm. long, 2-3 mm. wide, entire, minutely scabrous; heads solitary and terminal, showy; involucral bracts linear-lanceolate or subulate, 6-13 mm. long, often purplish, woolly, the inner very acute; ray-corollas violet-blue, 20-25 mm. long, 3-3.5 mm. wide; achenes 5 mm. long, hirtellous.

Frequent on grassy subalpine slopes or in severe subalpine burns, commonly above 5000 ft., frequently occurring in dry situations much lower.

(6.) A. meritus A. Nels. Low perennials with creeping slender rootstocks, the stems ascending, thinly hirtellous, 15-25 cm. tall; lower leaves oblanceolate, tapering to indefinite petioles, 3-3.5 cm. long, 5-8 mm. wide, the upper oblong-oblanceolate, narrowed toward the base but rounded, the uppermost oblong, rounded at the base and sessile, all obtuse, subentire, the upper surfaces glabrous, the lower pubescent with short hairs; heads few, solitary or in corymbs, their peduncles and involucres definitely pubescent, bracts lanceolate, the inner 5 mm. long, all acute; ray-corollas purple 8-10 mm. long; achenes not seen.

Sand-bar, Upper Priest R., 3000 ft., Epling 7485.

Cap. ⑦ A. Hallii Gray. ~~Perennial~~ herbs 60 cm. tall, branching above, the branches strictly ascending, pubescent in lines; basal leaves 5-6 cm. long, linear-oblanceolate or spatulate, the median leaves mostly linear, sessile, 1.5-4 cm. long, 1.5-5 mm. wide, remotely toothed, glabrous but ciliate; heads rather numerous; involucral bracts 3-5 mm. long, linear-oblong, acute, glabrous, herbaceous; ray-corollas violet, 7-[illegible] mm. long; achenes 2-2.5 mm. long, glabrate.

Near Wallace, Epling and Houck 10110; ~~may need reinterpretation~~.

[illegible] by this specimen [illegible].

⑧ A. Douglasii Lindl. Erect herbs 60-90 cm. tall, ~~the~~ stems thinly hirsute above with ascending hairs, leafy, branching; median stem leaves 8-10 cm. long, 8-20 mm. wide, mostly linear-elliptical, tapering both ways from the middle, sessile and clasping, more or less serrulate; heads rather numerous in small corymbs; involucral bracts unequal, 3-6 mm. long, linear-oblong, acute, the outer herbaceous, the inner with herbaceous tips, all glabrous; ray-corollas violet, 10-12 mm. long; achenes 2 mm. long.

Frequent in meadows along the larger streams.

9. A. Eatoni (Gray) Howell. Slender erect ~~perennial~~ herbs with horizontal rootstocks, the stems 30-60 cm. tall, pubescent, the basal leaves linear-oblanceolate, the principal leaves 4-7 cm. long, 4-8 mm. wide, linear, tapering at the apex, acute, rounded-truncate and sessile, entire, those of the branchlets similar, 1.5-3 cm. long, all scabrous on margins; heads on short ascending branchlets forming an elongate panicle; involucral bracts oblong, obtuse but somewhat mucronate, glabrous, 5-6 mm. long; ray-corollas lavender or violet, 8-10 mm. long, 1-1.5 mm. wide; achenes not seen.

Frequent in meadows at lower elevations in the north.

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A. cordalenus Henders., reported from this area, has the outer involucral bracts linear and acute, lightly hairy.

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10. A. Franklinianus Rydb. Slender herbs 40-80 cm. tall, stems puberulent in decurrent lines in or near the inflorescence or glabrous throughout; basal leaves 6-8 cm. long, their blades 8-15 mm. wide, oblanceolate or spatulate, lower stem leaves subsessile and narrower, the principal stem leaves linear, 3-8 cm. long, 2.5-8 mm. wide, subacute, rounded-truncate at the base and sessile, entire, glabrous with scabrous margins; heads few, in terminal corymbs, their involucral bracts subulate, 5-8 mm. long, .6-.8 mm. wide, acute, the inner tapering, glabrous, minutely ciliolate; ray-corollas violet, 12-14 mm. long, scarcely 1 mm. wide; achenes hirtellous.

In moist meadows.

(11.) A. Englemannii (D.C. Eaton) Gray. Erect herbs 60-80 cm. tall, ~~the~~ stems thinly villous in the lower part, puberulent with short curled hairs and minutely glandular in the upper parts; basal leaves oblanceolate, soon withering, the stem leaves prevailingly elliptical, 4-8 cm. long, 1-2.5 cm. broad, acute at both ends, sessile, mostly entire, both surfaces thinly pubescent; heads few or numerous in rather round-topped clusters, involucral bracts in several unequal series, 5-8 mm. long, lanceolate, very acute, whitish, the margins usually purple-tinged, glabrous on the back, the margins strongly ciliate with soft hairs; ray-corollas rose-purple, 15-18 mm. long; achenes 3.5-4 mm. long, hirtellous.

In burns or thin reproduction or in open places; seen only in the north.

no ¶ → Upper Priest R., 3000 ft.; South Baldy Mt., 5000 ft.; Priest R. Exp. Sta., 3000 ft.; Packsaddle Peak.

(12.) A. laevis L. var. Geyeri Gray. Erect herbs with horizontal rootstocks, stems 40-90 cm. tall, glabrous and glaucous; basal leaves oblanceolate or spatulate, 8-15 cm. long, their blades 1.5-2.5 cm. wide, soon withering, the stem leaves oblong or oblong-lanceolate, 3-15 cm. long, 5-25 mm. broad, mostly acute, or the lower frequently obtuse, all firm, rounded-cordate at the base, clasping the stem, glabrous and glaucous, the leaves of the ascending branchlets similar but markedly reduced, giving a characteristic aspect to the plant, 5-20 mm. long; heads rather numerous, clustered towards the tips of the ascending strict branches, involucral bracts 4.5-7 mm. long, narrowly oblong, acute and somewhat spinose at the tips, the lowermost ciliate on the margins towards the base; ray-corollas violet-blue, 10-12 mm. long, 1.5 mm. wide; achenes glabrous, 2.5-3 mm. long.

Common in meadows along streams at lower elevations in the north.

⑬ A. Cusickii Gray. → Herbs 60-90 cm. tall or more with horizontal rootstocks, their stems white woolly, at least in the upper parts; basal leaves oblanceolate, 6-12 cm. long, oblanceolate or spatulate, soon withering. the lower stem leaves which are similar but less attenuate, 10-15 cm. long, 2-5 cm. broad, acute, the margin convex above the middle, concave below, usually entire, less often sharply and remotely serrulate, the upper surfaces glabrate or hirtellous with short appressed hairs, the lower softly woolly, especially along the midveins, cinereous; heads not numerous, rather showy, in more or less lax corymbs, frequently somewhat panicled; involucral bracts unequal, the outer herbaceous, 8-10 mm. long, one or more usually subfoliar, and longer, all more or less pubescent at least on the upper surfaces, acute; ray-corollas 15-20 mm. long, lavender or violet-blue; achenes hirtellous. ( A. Jessicae Piper; A. Hendersonii Fernald).

Frequent in moist meadows or along streams at lower elevations amongst herbage, infrequently in burns.

⑭ A. foliaceus Lindl. → Erect ~~perennial~~ herbs commonly 50-80 cm. tall, rarely as low as 30 cm., the stems slender, often branching above ~~in the upper parts~~, the branches slender, ascending, thinly hirsute in the upper parts with slender mostly ascending hairs, ~~these frequently upon one side only~~; basal leaves 6-12 cm. long, oblanceolate or spatulate, their blades 1-3 cm. broad, often persistent, ~~these passing into~~ the lower stem leaves ~~which are~~ similar but less attenuate and more oblong, the middle stem leaves 1-2 cm. wide, narrowly oblong-elliptical or even linear-elliptical, narrowed both ways from the middle but obtuse or subacute at the apex, very blunt or rounded at the base, hardly clasping, such upper leaves commonly 3-8 cm. long, 8-15 mm. wide at the middle, all leaves glabrous except for ciliate margins; heads few, ~~(solitary in some depauperate individuals)~~ subcorymbose, each principal branch usually bearing 2 or more heads; their involucral bracts 5-8 mm. long, the outer herbaceous, some occasionally longer than the inner and more or less oblanceolate, the inner with acute mostly herbaceous tips, all glabrous but ciliolate on the margins: ray-corollas 10-15 mm. long, violet-blue; achenes 2.5-3 mm. long, sparsely hirtellous.

Frequent in meadows at 2500-3000 ft. elevations, occasionally appearing at higher elevations in burns.

15. A. Fremontii (T. & G.) → Herbs 30-60 cm. tall with slender, usually unbranched stems thinly hirsute in the upper parts with slender mostly ascending hairs; basal leaves quickly withering, 6-8 cm. long, 8-15 mm. wide, narrowly oblanceolate, the stem leaves linear-oblong, acute, not markedly tapering below the middle, or concave, clasping at the base, entire, 4-12 cm. long, rarely more than 1 cm. wide, entire, glabrate except for a ciliate margin; heads few, commonly in racemes upon nearly or quite naked peduncles 1-4 cm. long or more, or if longer, bearing one or two small leaves toward the apex; involucral bracts 5-8 mm. long, lanceolate, acute, the outer herbaceous, the inner with acute herbaceous tips, glabrous but ciliolate upon the margins; ray corollas 11-14 mm. long, violet-blue; achenes not seen.

Rich meadows along streams or lakes.

16. A. Canbyi (Gray) Vasey. → Erect ~~perennial~~ herbs 30-60 cm. tall, the stems slender, villous in the upper parts with spreading more or less woolly hairs, ~~these frequently upon one side only~~; basal leaves 12 cm. (wide), soon withering, ~~these passing into the~~ the lower stem leaves ~~which are~~ similar but less attenuate, more elliptical-oblanceolate, narrowed below the middle but broadening again at the sessile clasping base, the upper stem leaves prevailingly oblong, often broadest near the base, tapering near the apex, 6-9 cm. long, 1-3 cm. wide, the clasping base rarely less than 1 cm. wide, all glabrous on both surfaces, the margins ciliate; heads frequently solitary, rarely more than five or six in a loose corymb, their involucral bracts largely green and herbaceous, unequal, the outer commonly longer than the inner, an occasional one as much as 2.5 cm. long and subfoliar, frequently 3-4 mm. broad, though commonly 8-10 mm. long and 1.5-2.5 mm. broad, all glabrous but with ciliate margins; ray-corollas violet-blue, 15-25 mm. long; achenes hirtellous. =/

Common in subalpine meadows and along subalpine streams, rarely as low as 3000 ft. in subalpine communities.

## 16. Erigeron L.

Annual, biennial or perennial herbs with alternate leaves, these frequently in basal tufts, the stems subscapose, or more or less evenly distributed along the stem, the basal leaves prevailingly spatulate or oblanceolate, passing into the sessile oblong or linear stem leaves. Heads solitary or numerous, most often in corymbs, rarely in oblong panicles, their involucral bracts mostly in 2-3, rarely in 4, series, subequal or somewhat unequal, similar, lanceolate or subulate, the tips mostly scarious or thin, receptacle flat, naked. Ray-flowers pistillate, white, lavender, violet or pink, their limbs with one exception 1 mm. wide or less. Disc-flowers perfect, yellow or yellowish. Achenes narrowly top-shaped, mostly flattened, bearing 5 veins; pappus a single series of scabrous bristles, frequently bearing a secondary row of very short bristles at their bases.

0 Ray corollas bluish-purple, 2-2.5 mm. wide — 1. E. salsuginosus

0 Ray corollas 1 mm. wide or less, rarely somewhat broader

2 Low tufted plants 5-40 cm. tall, their leaves, or leaf 6 segments if divided, 1-5 mm. broad =/

4 Leaves prevailingly twice ternate, at least once 8 ternate — 2. E. compositus

4 Leaves entire, linear or linear-oblanceolate

6 Leaves and stems hoary-pubescent with small 10 appressed hairs, the former 1-2 mm. wide — 3. E. filifolius

6 Leaves and stems thinly hirsute with spreading 10 hairs, the former 2-5 mm. wide — 4. E. caespitosus

8 Plants 5-20 cm. tall, usually densely 12 caespitose; leaves oblanceolate, blunt or short acuminate; heads solitary and terminal on each stem

8 Plants 20-40 cm. tall, usually not 12 caespitose; leaves linear or linear-lanceolate, tapering; heads 2-3 on each stem =/ — 5. E. corymbosus

2 Erect plants commonly 30-60 cm. or more, or if less, 6 depauperate individuals of an annual species with heads 4-7 mm. broad or if perennial, the basal leaves spatulate, their blades 4-12 mm. broad

4 Heads at most 5-7 mm. in diameter; inflorescence 8 an oblong panicle with subequal branches — 6. E. canadense

4 Heads 1[illegible] mm. broad, inflorescence never an oblong panicle

6 Heads bearing, in addition to the very slender ray-flowers and immediately within that series, a series of threadlike flowers which are pistillate only 10 — 7. E. acris

6 Heads bearing only ray-flowers and ordinary disc-flowers which have both pistil and stamens 10

8 Leaves linear-oblanceolate, for the most part 3-5 mm. wide, ashy-hirsute 12 — 8. E. concinnus

8 Leaves oblanceolate or oblong, for the most part 5-15 mm. wide, thinly hirsute or glabrous 12

10 Heads 32-35 mm. wide, the ray corollas white; plant softly hirsute 14 — 9. E. Coulteri

10 Heads 10-30 mm. wide, the ray corollas violet or rose, or if white the heads 15 mm. broad or less; plants sparingly hirsute or glabrous 14

12 Heads 10-20 mm. broad, their involucral bracts 3-5 mm. long; annuals or biennials 16

14 Ray-corollas 5-6 mm. long, white; stem leaves sessile but not clasping 18

16 Stems thinly hirsute with spreading hairs; lower stem leaves mostly toothed 20 — 10. E. annuus

16 Stems thinly hirsute with ascending or appressed hairs; lower stem leaves mostly entire 20 — 11. E. strigosus

14 Ray-corollas 8-10 mm. long, pink or rose-purple, rarely white; stem leaves clasping 18 — 12. E. philadelphicus

12 Heads 15-[illegible] mm. broad, their involucral bracts 5-8 mm. long; perennials 16

14 bracts hirsute; stem leaves hirsute — 13. E. glabellus

~~Heads viscidulous with minute glands, scarcely or not at all hairy~~

glandular, or, if hirsute, then only

14 Bracts ~~hirsute~~ at the very base; stem leaves glabrate, but ciliate ~~14. E. speciosus~~

16 Bracts glandular only; stem hirsute, scabrous — 15. E. macranthus

[illegible]

1. E. salsuginosus (Richards.) Gray → Perennial herbs with stout horizontal rootstocks, the stems ascending, 30-60 cm. tall, hirtellous; basal leaves tufted, some usually spatulate, their blades oval or elliptical, obtuse or rounded, 3-6 cm. long, ~~some oblanceolate and acute, all~~ tapering to indefinite petioles as long as the blades or longer, the lower stem leaves ~~similar~~ soon passing into smaller oblong or ovate sessile acute or acuminate leaves 2-6 cm. long, 1-3 cm. wide, all leaves glabrous or nearly so, entire; heads solitary and terminal or few in a corymb, showy, 3.5-4 cm. broad at maturity, their involucral bracts in 3-4 series, subulate, 4-6 mm. long, attenuate at the tips, glandular; ray-corollas 14-15 mm. long, 2-2.5 mm. broad, violet or purplish; achenes 2.5 mm. long.

Common in subalpine meadows and amongst bear grass, occurring also in meadows as low as 2400 ft., rarely in burns.

2. E. compositus Pursh. var. multifidus (Rydb.) Macbr. & Payson. → A small perennial 5-15 cm. tall, commonly with a branching caudex, its stems slender, ascending, sparingly glandular and sparsely hirsute with spreading hairs; basal leaves tufted, their blades prevailingly twice ternate, the ultimate segments 2-4 mm. long, blunt, thinly hirsute, borne on petioles 1-2 cm. long, their margins strongly ciliate especially towards the base; stem leaves linear, 5-12 mm. long, acute, or the lowermost trifid at the summit, sparingly hirsute; heads solitary, terminal, the involucral bracts subulate, 5 mm. long, acute, sparingly hirsute with long hairs; ray-corollas white or lavender, 5 mm. long; achenes 2 mm. long.

Snowy Top Mt., 6000 ft., Epling 6660; Fish Lake, 6600 ft., Epling; Steven's Peak, ~~1980 m.~~, Leiberg 1468. 6450 ft.

var. typicus Payson. Leaves prevailingly 3-4 times ternate. →

no ff → Post Falls, Johnson 65; Potlatch R., Henderson.

3. E. filifolius (Hook.) Nutt. → A small perennial herb with a much branched caudex and stout tap root, the stems several, ascending, 10-30 cm. tall, branching above, pubescent with small appressed hairs; leaves principally in basal tufts, linear or linear-oblanceolate, 1-3.5 cm. long, 1-2 mm. wide, entire, ashy with short appressed hairs; heads not numerous, their involucral bracts 2-4 mm. long, lanceolate, acute, minutely glandular; ray-corollas violet, 6 mm. long; achenes 1 mm. long.

Occasional in gravelly soil or on outcrops at low elevations. →

no ff → Sandpoint, Epling 10440.

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Cap. E. pumilus Nutt. may be expected in dry prairies. It is similar to the preceeding but may be recognized by the spreading hispid pubescence.

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4. E. caespitosus Nutt. Low tufted perennials with a more or less branched leafy caudex, the stems few, ascending, 8-15 cm. tall, pubescent with short spreading hairs; basal leaves oblanceolate, 2-4 cm. long, 2-4 mm. wide, subacute, entire, thinly pubescent, the stem leaves similar, but smaller, few; heads solitary on each stem, their involucral bracts linear-lanceolate, acute, pubescent, 5-6 mm. long; ray-corollas violet, 8-9 mm. long, 1-1.2 mm. wide; achenes not seen. =/

Turners Butte, Thomas.

5. E. corymbosus Nutt. Low perennial herbs with elongated tap roots and several ascending stems 20-40 cm. tall, arising from a branching caudex; basal leaves linear, wider toward the apex, 6-12 cm. long, 2-5 mm. wide, rarely more, rather conspicuously veined, rough pubescent; stem leaves ~~similar~~ gradually diminished upwards, more nearly linear; heads 2-3 on each stem, borne on nearly naked peduncles which become elongated and ascend~~ing~~ to form a loose corymb; ~~their~~ involucral bracts narrowly lanceolate, 4-5 mm. long, ashy with harsh hairs; ray corollas violet, 12 mm. long; mature achenes not seen.

Dry gravelly soil in association with lodgepole or yellow pine or in the grassland.

6. E. canadense L. Erect slender annuals 40-80 (or only 10) cm. tall or more, ~~as low as 10 cm. in depauperate individuals~~ the stems wandlike, very sparsely hirsute; lower leaves oblanceolate, 3-6 cm. long, obtuse, narrowed gradually to an indefinite petiole, upper leaves ~~passing gradually into~~ linear, sessile ~~leaves~~ 1.5-3 cm. long, ~~these typical of the upper part of the stem and inflorescence~~, all entire or very sparingly toothed with small sharp teeth, thinly hispid, ~~especially on the margins and upper surfaces~~; inflorescence an oblong panicle 20-40 cm. long with numerous heads, its branches ascending, sometimes a single raceme ~~in depauperate individuals~~; involucral bracts in about 3 unequal series, the inner 3-3.5 mm. long, linear lanceolate, acute, glabrous, the midrib prominent; ray-corollas white, scarcely exceeding the bracts, the limb shorter than the tube; achenes 1.5 mm. long.

Occasional in dry burns or waste places at low elevations; introduced.

*E. acris* L. var. *asteroides* (Andrz.) DC. An erect biennial herb 40-60 cm. tall, the stems slender, sparingly hirsute with short spreading hairs glandular above, usually branched in the upper axils, the branches arcuate-ascending; basal leaves spatulate or narrowly oblanceolate, 5-12 cm. long, the lower stem leaves similar, more attenuate, longer, soon passing into narrowly oblong-lanceolate leaves which are sessile but more or less narrowed to the base, not rounded, mostly acute, all entire, with ciliate margins, the lower commonly thinly hirsute; heads usually numerous, their involucral bracts subulate, 4-6 mm. long, attenuate at the apex, minutely glandular and thinly hirsute; ray-corollas 6-7 mm. long, .3 mm. wide, pink or lavender, within them a series of threadlike pistillate corollas; achenes 1.5 mm. long, the pappus *shining*, *buff-color*, *copious*.

Frequent in burns and in gravelly open places at lower elevations; introduced.

var. *debilis* Gray. Similar but more or less depauperate, as low as 8-10 cm. tall, bearing only a few leaves, these more spatulate, and solitary heads, or more commonly 15-20 cm. tall, the heads solitary or 2-3, usually more glandular.

In thin, ~~soil~~ rocky soil usually at higher elevations but frequent in similar situations at lower elevations.

*E. concinnus* (H. & A.) T. & G. Erect, the stems usually several from a leafy crown, 20-30 cm. tall, branching above, *ashy-hirsute with soft spreading hairs and minutely glandular in the inflorescence*; basal leaves linear, 3-8 cm. long, *3-5 mm. wide* near the apex, tapering gradually downward, stem-leaves similar, ~~gradually diminished higher on the stem~~ the uppermost 8-12 mm. long, all ashy-hirsute; involucral bracts 4-5 mm. long, narrowly oblong, acute at the apex, hirsute and minutely glandular, the veins prominent, somewhat ridged; ray-corollas white, lavender or pink, 8-9 mm. long, .7-.8 mm. wide; achenes scarcely 1 mm. long.

Frequent in dry ground at low elevations.

9. *E. Coulteri* Porter. Perennial, the stems 20-40 cm. tall, sparingly hirsute with spreading hairs; basal leaves 8-15 cm. long, oblanceolate or spatulate, entire or somewhat toothed, the lower stem leaves ~~similar but~~ less attenuate, sparingly and remotely toothed, the upper stem leaves oblong or elliptical, rounded at the base, sessile and clasping, acute, entire or nearly so, all *softly hirsute*; heads mostly solitary and terminal, frequently two, the second on a long peduncle from the upper axils, ~~their~~ bracts *8-9 mm.* long, subulate, thin, white-woolly especially towards the base; ray-corollas *white*, numerous, *15 mm.* long, 1-1.5 mm. wide; mature achenes not seen.

Frequent about mountain meadows.

10. E. anmuus (L.) Pers. → Erect slender annuals or biennials, 40-60 cm. tall, thinly hirsute with spreading hairs, branching in the upper axils, the branches elongate, ascending; lower leaves oblanceolate or spatulate, 5-8 cm. long, more or less toothed, upper stem leaves prevailingly oblong-elliptical, entire, subacute; heads not numerous, disposed in small corymbs at the tips of the corymbose branches; bracts thin and membranous, in about 3 series, 3-4 mm. long, thinly hirsute; ray-corollas white, scarcely .5 mm. broad, 6 mm. long; achenes not seen.

Introduced. Clarkia, Epling & Offord 8224.

11. E. strigosus Muhl. → Erect annual or biennial herbs 40-80 cm. tall, branching in the upper axils with long ascending branches, thinly hirsute or hispid with ascending hairs; basal leaves 2.5-3 cm. long, spatulate, the blades 1-1.5 cm. long, the principal stem leaves linear or linear-oblanceolate, 2-8 cm. long, sessile, entire, mostly acute, thinly hirsute; heads numerous in elongate corymbs, their bracts 2.5-4 mm. long, oblanceolate, acute, hispid, their margins thin and scarious; ray-corollas white, 4-4.5 mm. long, .5 mm. wide; achenes 1 mm. long.

Frequent in dry gravelly soil at low elevations.

12. E. philadelphicus L. → Perennial herbs 60-120 cm. tall, thinly hirsute with spreading hairs, branched in the upper axils; basal leaves spatulate or oblanceolate, 8-15 cm. long, stem leaves gradually becoming oblong-oblanceolate and sessile, those above the middle ovate-oblong, or the uppermost even narrowly deltoid, clasping, acute, the lower more or less coarsely and irregularly toothed, thinly hirsute, or the upper leaves glabrate; heads numerous, arranged in small corymbs at the ends of the branches, their involucral bracts 4-5 mm. long, narrowly oblong, attenuate and scarious at the tips and somewhat lacerate, sparingly hirsute and somewhat glandular; ray-corollas pink or rose purple or rarely white, 8-9 mm. long, .5 mm. wide; achenes scarcely 1 mm. long.

Occasional in burns at low elevations. Upper Priest R.; Bonners Ferry.

13. E. glabellus Nutt. Perennial herbs 30-40 cm. tall, the stems commonly 2-3, hirsute with spreading hairs; basal leaves oblanceolate or spatulate, 3-5 cm. long, passing into the lower stem leaves which are similar but larger, 5-8 cm. long, more acute, less attenuate, the leaves above the middle much reduced, 1.5-3 cm. long, linear-lanceolate, very acute or attenuate towards the apex, sessile, all hirsute, entire; heads solitary or 2-4, then solitary and terminal on slender branches ~~from the uppermost branches frequently half as long as the stem~~; involucral bracts 6-7 mm. long, linear, attenuate at the tips, hirsute; ray-corollas 12 mm. long, 1 mm. wide, purple; achenes 1.2 mm. long.

Upper Priest River, 3000-5000 ft., Epling 7560; d'Urbal.

14. E. speciosus DC. → Perennial herbs with several ascending stems, 30-60 cm. tall, leafy throughout, nearly glabrous; basal leaves narrowly oblanceolate, 4-8 cm. long, the lower stem leaves more attenuate, the petioles of both ciliate, these passing into the narrowly oblong upper leaves which are 2.5-6 cm. long, 5-10 mm. broad, prevailingly acute, rounded at the base and sessile, with ciliate margins, all entire, the surfaces of all glabrate, bearing a few spreading hairs; heads few, solitary and terminal or few in corymbs, their involucral bracts subulate, 5-7 mm. long, attenuate at the apex, minutely glandular, hirsute at the very base; ray-corollas lavender or violet, 12-14 mm. long, .8 mm. wide; achenes 1.5 mm. long.

Frequent in subalpine meadows and along stream bottoms chiefly above 3000 ft.; very close to E. macranthus.

15. *E. macranthus* Nutt. An erect perennial with usually 2-3 stems from a woolly caudex, 40-80 cm. tall, more or less scabrous with minute conical protuberances toward the inflorescence or sparingly hirsute with spreading hairs; lower leaves soon withering, oblanceolate or spatulate, 4-10 cm. long, obtuse, the stem leaves chiefly oblong, rounded or rounded-truncate at the base, sessile and somewhat clasping, tapering above the middle, mostly obtuse or the upper acute, 3-6 cm. long, 10-14 mm. wide, all entire, *ciliate on the margins*, the surfaces prevailingly *glabrous*; heads few in terminal corymbs, their bracts subulate, very acute, 6-8 mm. long, *minutely glandular*; ray-corollas numerous, violet, 12-15 mm. long, 1 mm. wide; achenes not seen. =/

Occasional in open woods and burns.

no H Hughes Fork, 3000 ft., *d'Urbal*; Pritchard, *Epling and Houck 10165*; Upper Priest R., 3000 ft., *Epling 7557*.

Often diminutive annual or perennial woolly or cobwebby herbs with alternate stem leaves and a distinctive hay-like odor. Bracts of the involucre green and herbaceous (in Adenocaulon strongly incurled), becoming papery and persistent, opaque white or rose (in Psilocarphus an inflated sac containing the achene). Ray flowers none. Heads frequently unisexual and then dioecious, the pistillate corollas very slender, hair-like; receptacle flat or convex, naked. Anthers tailed at the base. Pappus of capillary bristles (in Adenocaulon and Psilocarphus none). Achenes, with or without a pappus, there of Adenocaulon 4-6, per head rotate at maturity.

## 17. Psilocarphus Nutt.

Cap. ~~Small wooly~~ annuals with simple entire mostly opposite leaves. Heads discoid, inconspicuous, borne in the forks of the branches or in terminal clusters, subtended by a loose cluster of leaves; involucres globose, the bracts softly woolly, strongly incurved and hooded and bearing on the inner surface a membranous appendage, each completely enclosing a pistillate flower, becoming at maturity an inflated obovate sac open on the inner side in the lower half. Staminate flowers bractless, borne in the centre of the head. Achenes ellipsoid or cylindrical, without a pappus, smooth, loose in the bladder like bract.

o leaves 5-10 mm. long; plants prostrate or nearly
4 so; mature bracts 2 mm. tall 1. P. oreganus

o Leaves 1-2.5 cm. long; plants erect; mature bracts
4 3 mm. tall 2. P. elatior

1. P. oreganus Nutt. → Low more or less prostrate annuals 3-5 cm. tall, with very slender forking stems; leaves 5-8 mm. long, sessile, oblong-elliptical, obtuse at both ends, softly woolly; heads green and inconspicuous, clothed with soft wool, ~~borne in the forks of the branches,~~ subtended by several leaves; bracts of the involucre scarcely 1 mm. tall at anthesis, becoming 2 mm. tall and reticulately veined, the intervenous tissue often disappearing; staminate flowers scarcely 1 mm. tall, tipped with rose-purple; achenes shining, 1 mm. long.

In dried mud of vernal pools in the grassland. →

no ¶ → Thatuna Hills, Epling and Houck 9080.

2. P. elatior Gray. → Small erect annuals softly woolly throughout, ashy, 8-12 cm. tall, the stems slender, branching especially above or throughout; leaves narrowly oblong, or the upper oblanceolate, 1-2.5 cm. long, 2-4 mm. wide, all sessile, entire; heads globose, axillary, subtended by a whorl of leaves, ~~softly woolly with rather close tangled wool~~; bracts 1.5 mm. tall at anthesis, increasing to 3 mm. in fruit, the appendage a scarious flap .7 mm. long; pistillate flowers pinkish or colorless; staminate flowers reddish purple; achenes oblanceolate, 1 mm. long.

Moscow, Piper 2277

Drying ground.

## 18. Adenocaulon Hook.

Perennial herbs with rootstocks and alternate ample leaves. Heads discoid, small, greenish, few, in diffuse panicles. Involucres top-shaped, their bracts in a single series, joined at the base, the receptacle flat. Marginal flowers pistillate, usually about 6, the central flowers sterile, naked, about the same in number. Achenes arranged in a spreading circlet, clavate, obtuse, pappus none.

1. A. bicolor Hook. → An inconspicuous ~~perennial~~ herb 50-60 cm. tall, the leaves borne in the lower axils, their blades deltoid, 5-10 cm. in diameter, the apex and lobes rather obtuse, cordate-truncate at the base, coarsely sinuate-dentate, the teeth 3-8 mm. tall, the upper surface glabrous, green, the lower white, covered with a dense felt-like tomentum, borne on margined petioles as long as the blades or longer; heads ~~few~~ in a diffuse glandular and viscid panicle with slender branches, their involucres herbaceous, 1-1.5 mm. tall; marginal flowers developing into a rotate series of 4-6 clavate achenes 7-8 mm. long at maturity, beset with stalked glands, the central flowers sterile, persistent.

Abundant in moist shaded woods at lower elevations throughout our region.

### 19. Gnaphalium L. Everlasting.

Cap ~~Annual or biennial~~ woolly or somewhat glandular herbs with alternate entire leaves which are sessile and often decurrent upon the stem. Heads small, discoid, their involucres hemispheric or ovoid, the bracts chaffy or scarious, commonly white and shining at least in part, arranged in several loosely appressed series; receptacle naked, convex. Marginal flowers pistillate, fertile, the central flowers perfect. Achenes columnar, bearing a pappus of soft deciduous bristles.

0 Low bushy annuals, 3-20 cm. tall; heads surrounded by leaf-like
4 bracts, forming a leafy involucre 1. G. palustre

0 Erect perennials or biennials, 30-90 cm. tall; heads without leafy
4 investing bracts

2 Stems white-woolly throughout; leaves white-woolly on both
6 surfaces 2. G. microcephalum

2 Stems thinly glandular-pubescent below; leaves green and gland-
6 ular-pubescent above, white-woolly beneath 3. G. Macounii

1. G. palustre Nutt. → A small woolly annual 3-20 cm. tall, mostly branched at the base, the stems usually slender; leaves oblanceolate, 1-1.5 cm. long, 2.5-5 mm. wide, rarely as much as 3 cm. long and 6-7 mm. wide, obtuse, sessile, entire, loosely woolly with soft hairs, frequently becoming glabrate, those below the clusters of heads crowded, forming a leafy involucre; heads few, crowded in the upper axils, their involucres bell-shaped, the bracts 3-3.5 mm. long, narrowly oblong, obtuse, thin and scarious or membranous, green below, then brownish, white at the tips; flowers whitish; achenes .5-.6 mm. long, minutely roughened.

Frequent at lower elevations in muddy ground or vernal pools which later dry; occasional in burns.

2. G. microcephalum Nutt. → A white-woolly perennial herb, the stems several or solitary, slender, 30-50 cm. tall; leaves linear-oblanceolate, the upper linear-lanceolate, only the lowermost narrowed to indefinite petioles, the rest sessile, all decurrent upon the stems for 5-8 mm., more or less white-woolly, acute; heads in ovoid or subglobose clusters at the tips of the branchlets, the branches of the inflorescence ascending; involucral bracts 2-4 mm. long, the outer broadly ovate, obtuse, the inner narrowly oblong or lanceolate, acute, thinly woolly and green below the middle; flowers yellowish; achenes .7 mm. long, mostly curved.

Frequent in burns at low elevations.

③ G. Macounii Greene. An erect biennial 60-90 cm. tall, the stems virgate, more or less branched in the uppermost axils, the branches ascending, thinly glandular-pubescent in the lower parts, white-woolly above; leaves of the basal tuft oblanceolate, 3-4 cm. long, the lower stem leaves longer, as much as 6-8 cm. long, the upper leaves narrowly oblong or oblong-lanceolate, prevailingly acute, sessile, decurrent upon the stems for .5-1.5 cm., glandular-pubescent and green on the upper surfaces, white-woolly beneath; heads in ovoid or globose more or less convex clusters in the uppermost axils; involucral bracts very scarious, shining white, ovate or the inner lanceolate, 4-5 mm. long, the tips acute, usually somewhat lacerate, all more or less woolly at the base, the short peduncles densely so; flowers yellowish.

Frequent in dry burns, along roadways or in waste places.

## 20. Anaphalis DC.

Erect perennial herbs with alternate entire leaves. Heads numerous, showy en masse, partly dioecious, the pistillate heads, however, often having some perfect flowers at the middle, their involucres hemispherical or subglobose, consisting of several series of very white opaque chaffy bracts; receptacle convex, naked. Flowers yellow. Achenes ellipsoid, the pappus threadlike, the bristles distinct.

1. *A. margaritacea* (L.) Gray var. *occidentalis* Greene. Pearly Everlasting. Erect perennial herbs 40-60 cm. tall, the stems branching only in the inflorescence, white-woolly; leaves narrowly oblong or oblong-lanceolate, acute, entire, sessile, 4-12 cm. long, 5-20 mm. wide, the upper surfaces commonly green and glabrous, the lower white-woolly; heads numerous in terminal convex clusters, 4-5 mm. broad, their involucral bracts 4-5 mm. broad, the outer oval, blunt, the inner linear or narrowly oblanceolate, all very white and opaque above the middle, translucent ~~and bearing usually a small tuft of hairs below the middle~~; corollas 4 mm. tall, the pappus threadlike, somewhat longer.

Common on burns and meadows and along roadways at all elevations.

## 21. Antennaria Gaertn.

Low, white-woolly perennials which usually propagate by leafy stolons, these frequently spreading and conspicuous. Basal leaves in tufts, the stem leaves alternate. Heads discoid, usually in a globose cluster, racemose in one species, dioecious, their involucres consisting of several series of unequal membranous or scarious bracts, those of the staminate plants being usually broader and more obtuse than the pistillate; receptacle flat, convex, hemispherical or subconical, naked. Pistillate corollas tubular, very slender, closely investing the slender style; their achenes more or less cylindrical, glabrous or sparsely glandular with minute glands, the pappus fine, soft, hair-like, united at the base and quickly deciduous. Pappus of staminate flowers more or less dilated at the apex, even spoon-shaped. Flowers whitish or tipped with pink.

0 Densely tufted plants forming cushions 3-5 cm. tall;
4 heads but little exceeding the foliage, solitary in the axils — 1. A. dimorpha

0 Plants with erect stems which bear the heads

2 Heads in racemes, the racemes minutely glandular — 2. A. racemosa

2 Heads in globose or flat-topped clusters, the
6 stems woolly to the apex

4 Upper surfaces of the leaves soon glabrous and
8 green, the lower white-wooll — 3. A. Howellii

4 Both surfaces of the leaves white-woolly

6 Heads mostly in flat-topped clusters, the
10 lower branches of the inflorescence 2-4 cm. long, rarely subglobose — 4. A. luzuloides

6 Heads in globose or hemispheric usually
10 dense clusters the peduncles rarely 2 cm. long

8 Bracts brownish or blackish at or above
12 the middle, acute

10 Stem leaves 1-1.5 cm. long or less,
14 1-2 mm. wide — 5. A. media

10 Stem leaves 1.5-5 cm. long, 4-7
14 mm. wide — 6. A. lanata

8 Bracts dull white or rose color, prevail-
12 ingly blunt at the apex

[illegible]
14 [illegible]

12 Flowering stems prevailingly 20-40 cm. tall; 16 bracts usually pink or rose-purple — 7. A. rosea

2 Flowering stems prevailingly 10-20 cm. tall; 16 bracts greenish-white — 8. A. confinis

10 Bracts opaque, firm, chalky white at the tips

12 Leaves 4-8 cm. long; clusters of heads 3-4 16 cm. broad — 9. A. anaphaloides

12 Leaves 1-2.5 cm. long; clusters of heads 16 2-2.5 cm. broad — 10. A. albescens

1. A. dimorpha (Nutt.) T.& G. → Densely tufted perennials forming small cushions 2-5 cm. tall, the rootstocks comparatively stout, branched; leaves very white-woolly, oblanceolate or spatulate, 1-2 cm. long, tufted; heads solitary in the axils, subsessile, but little exceeding the leaves, the bracts of the pistillate heads membranous, glabrous, the outermost ovate, 4-6 mm. long, the inner linear, or linear-oblanceolate, 10-12 mm. long, tinged with purple, those of the staminate heads similar but somewhat shorter, green, tinged at the apex with brown; pappus of both kinds of flowers very fine and hair-like; achenes cylindrical, 3 mm. long, puberulent.

Dry pine woods, Post Falls, St. John 4305.

2. A. racemosa Hook. → slender perennial 15-50 cm. tall, with ~~propagating by~~ conspicuous leafy prostrate stolons, the stems woolly towards the base, glabrous above, glandular in the inflorescence; basal leaves and those of the stolons 2.5-5 cm. long, 1.5-2.5 cm. wide, mostly oval, obtuse at both ends, the upper surface green and glabrous, the lower white-woolly, borne on petioles 1-2 cm. long, stem leaves oblong or elliptical, sessile, acute, 5-12 mm. wide, ~~gradually~~ diminished upwards; heads few in terminal racemes 8-20 cm. long, borne on slender peduncles 1-3 cm. long, these sometimes forked; bracts of staminate heads 3-4.5 mm. long, oblong, obtuse, scarious towards the apex, 1 mm. wide or more, buff-colored, their flowers 3.5 mm. long, the pappus 4-4.5 mm. long, somewhat dilated toward the apex, coarser than that of the pistillate flowers; bracts of the pistillate flowers 3-6.5 mm. long, the outer scarious and obtuse, the inner chaffy, somewhat rigid, lanceolate, acute, 1 mm. wide or less, their flowers filiform, the pappus 5-6 mm. long, very fine, even; achenes 1.5 mm. long. Cap.

Common in open woods and low hillsides towards the grassland.

Cap. 3. A. Howellii Greene. → ~~Perennial woolly~~ herbs with branching more or less woody rootstocks, the stems 20-40 cm. tall, more or less woolly; basal leaves obovate or spatulate, 15-35 mm. long, 5-12 mm. wide, mostly tapering to an indefinite petiole, the upper surface green and nearly glabrous, the lower densely white-woolly; stem-leaves linear-oblong, 1.5-2 mm. wide, acute, sessile; heads of the pistillate plants borne in globose clusters at the tips of the stems, the peduncles being as much as 2 cm. long at maturity, usually less, their involucres 7-8 mm. tall, the bracts narrowly lanceolate, acute, green and membranous below, woolly at the base, brownish toward the middle or some brownish throughout, the tips being white and scarious; achenes 1.5 mm. long, cylindrical, sparingly glandular, the pappus soft and white, 7 mm. long; staminate plants unknown to me.

Frequent in open places and open dry woods at lower elevations.

4. A. luzuloides T.& G. → Tufted woolly perennials with several or numerous stems arising from the same branching caudex, 20-40 cm. tall, the basal leaves oblanceolate, 1.5-5 cm. long, 2.5-6 mm. wide, the cauline leaves prevailingly linear, acute at both ends 3-5 cm. long; heads in flat-topped clusters which may infrequently be so dense as to be subglobose, those of the pistillate plants 4.5-5 mm. tall, their bracts scarious in 4-5 unequal series, the outermost oval or ovate, the innermost narrowly lanceolate, acute, all more or less tinged with brown, the flowers tinged with rose-color, the achenes 1.5 mm. long, sparsely sprinkled with minute blunt glands; heads of the staminate plants semi-globose, 4 mm. tall, the outer bracts similar to those of the pistillate plants, the inner oblong, very blunt, firm and pure white at the tips, widely spreading and persistent in age, the pappus of the male flowers strongly dilated at the tips, .25 mm. broad, pure white.

Frequent in gravelly soil on open slopes near the grassland.

5. A. media Greene. → Low, densely woolly tufted perennials with creeping branching rootstocks, the flowering stems 8-15 cm. tall; basal leaves oblanceolate and spatulate, 8-15 mm. long, 2-4 mm. wide, mostly obtuse, white-woolly on both surfaces, the stem leaves mostly linear; heads in dense globose clusters, the involucral bracts of the pistillate heads 4.5-5.5 mm. long, oblong-lanceolate, in 2-3 series, very thin and membranous, green and woolly in the lower half, blackish in the upper, the tips acute and somewhat lacerate; staminate plants unknown to ~~me~~ us; achenes 1 mm. long, glandular puberulent.

Steven's Peak, ~~1980 m~~ 6450 ft., Leiber, 1404.

[redacted]

(6.) A. lanata (Hook.) Greene. → Low densely white woolly perennials 10-20 cm. tall, the rootstocks comparatively stout, ~~stems and leaves densely covered with a white woolly tomentum~~; basal leaves oblanceolate, 3-4 (or 8) cm. long, 3-5 (or 10) mm. wide, tapering gradually to the base, at least the upper stem-leaves broadest at the base and 4-7 mm. wide, sessile; heads in a dense globose cluster at the tip of the stem, the bracts of the pistillate plants 6-7 mm. long, narrowly oblong, about 1 mm. wide, mostly acute, scarious, more or less woolly, lacerate at the apex, dark brown or blackish toward the middle, lighter above and below, the achenes 1.5 mm. long, the pappus noticeably tapering upward, 6 mm. long, the mature receptacle flat, 3 mm. broad; bracts of the staminate flowers similar but broader in proportion, blunt, the tips being somewhat firmer and whiter, the pappus lightly dilated towards the tips, scabrous throughout.

On high mountain tops in thin rocky soil.

(7.) A. rosea (D.C. Eaton) Greene. → Pretty tufted woolly perennials with woody branching caudices, the stems mostly 20-40 cm. tall; basal leaves spatulate or oblanceolate, 15-20 mm. long, 2.5-4 mm. wide, acutish at the apex, white-woolly on both surfaces and somewhat silvery, the stem-leaves sessile, linear-oblanceolate, 2-3.5 cm. long, 1.5-4 mm. wide, distinctly tapering toward the base, acute, both surfaces woolly; heads of the pistillate plants borne in globose clusters at the tips of the stems on peduncles 2-3 mm. long, oblanceolate, pale pink to deep rose-color, in the upper half, sometimes white, mostly obtuse, or the inner acute, more or less lacerate or eroded at the apex, their margins usually somewhat crinkled below the middle, the outer tinged with brown towards the base; achenes 1.2 mm. long, the pappus fine, 4-4.5 mm. long, the mature receptacle hemispherical, 1 mm. broad; staminate plants unknown to ~~me.~~ us.

Frequent in gravelly soil especially in outcrops and open places in dry woods.

8. A. confinis Greene. → Pretty, tufted woolly perennials with woody branching caudices, the stems 10-20 cm. tall; basal leaves spatulate or narrowly obovate, obtuse at the apex, 6-12 mm. long, 2-5 mm. wide, white-woolly on both surfaces and somewhat silvery, the stem leaves sessile, oblong or linear-oblong, 1.5-3 mm. wide, 10-12 mm. long, mostly acute, both surfaces woolly; heads of the pistillate plants borne in globose clusters at the tips of the stems on peduncles 2-3 mm. long, their bracts oblanceolate, membranous and green or tinged with brown toward the base, scarious at the tips, not opaque, the innermost frequently tinged with rose, oblong, obtuse, more or less eroded or lacerate at the apex; achenes 1.5 mm. long, the pappus fine, 4-4.5 mm. long, the mature receptacle hemispherical, 1 mm. broad; staminate plants unknown to ~~me.~~ us.

Fish Lake, 6000-6800 ft., Erling and Houck 9812, 9561, 9579.

8 A. anaphaloides Rydb. Tufted herbs with rather stout branching rootstocks, the basal leaves linear-oblanceolate, 4-8 cm. long, 5-8 mm. broad, rather acute, tapering to an indefinite petiole, the flowering stems 20-40 cm. tall, bearing oblanceolate or linear leaves ~~gradually diminished upward~~; heads numerous in dense terminal convex clusters, 3-4 cm. broad; involucral bracts 4-5.5 mm. long, green and woolly towards the base, brownish at the middle, the upper parts opaque, white, dull, firm, rounded or blunt; pappus of staminate flowers spatulate, the margins more or less scabrous or eroded, that of the pistillate plants hair-like, barbed; achenes not seen.

Dry gravelly prairie, Post Falls, St. John 4317.

10. A. albescens (E. Nels.) Rydb. Low tufted woolly perennials 10-20 cm. tall; basal leaves obovate or spatulate, obtuse at the apex, 6-15 mm. long, 2-4 mm. wide, covered on both surfaces by a felt-like tomentum, stem leaves somewhat longer, 1-1.5 mm. wide, linear-oblanceolate, acute, sessile, woolly but less so than the basal leaves; heads of the pistillate plants in a semi-globose cluster at the apex of the stem on peduncles 2-3 (or 10) mm. long, their bracts 3-6 mm. long, 1.5 mm. wide, oblong, oblanceolate, obtuse, the outer subscarious, tinged with brown, very thinly woolly, the inner opaque, smooth, tan-colored or chalky, dull and rather firm, all more or less eroded or lacerate; achenes 1.1 mm. long, the pappus white, very fine, 4.5 mm. long; the mature receptacle hemispherical, 1 mm. broad; staminate plants unknown to ~~me.~~ us. =/

Snowy Top Mt., 6000 ft., Epling 8677; Steven's Peak, ~~1980 m~~ 6450 ft., Leiberg 1481; Collins, Elmer.

## Tribe Heliantheae.

l.c. Usually coarse herbs with all leaves opposite, or the upper alternate or the principal leaves in basal tufts. Heads showy with yellow ray-flowers, the disc-flowers yellow or purple → ✓(ray-flowers absent in *[illegible] [illegible]* and *[illegible]*); receptacles convex or conical, sometimes elongated, always chaffy. Involucral bracts herbaceous or foliaceous. Pappus wanting or consisting of membranous or chaffy scales or awns (these rigid and retrorsely barbed in *Bidens*), never hair-like bristles.

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## 22. Coreopsis L. Tickseed.

Annual or perennial glabrous herbs with opposite pinnately dissected leaves. Heads showy, the ray-flowers bright orange, borne on slender peduncles, their involucres saucer-shaped, consisting of two series of unequal bracts, the outer small and green, the inner several times larger, more or less orange colored or brownish; receptacles flat; ray-flowers 6-8; disc-flowers numerous, reddish-purple, semi-globose en masse, each subtended by a linear chaffy deciduous bract. Achenes flattened but convex on the back, scarious-margined; pappus none or consisting of two minute teeth.

1. C. Atkinsoniana Dougl. ~~Annual or perennial with~~ numerous tufted slender glabrous stems 30-50 cm. tall; lower leaves twice pinnately divided into linear lobes, the upper once-pinnate, the lobes 3-5, passing into the simple, linear bracts; heads borne in cymose panicles on unequal peduncles 2-3 mm. long, green, the inner oval or ovate, obtuse or acute, brownish or orange, membranous but firm, the bracts of the disc linear, chaffy, 5 mm. long; ray-corollas orange-colored, 12-20 mm. long, cuneiform, 3-4 lobed or toothed at the apex, frequently bearing a brown spot near the base of the limb; disc-corollas purple, achenes 2.5 mm. long, oval, scabrous. Cp.

Occasional in moist ground near water. →

no ¶ → Pearl Island, Dunkle; Sandpoint, Epling 10586; Lake View, MacDougal; Farmington Landing, Sandberg 617.

## 23. Balsamorhiza Hook.

Tufted perennial herbs with stout, fibrous-coated vertical rootstocks and simple leaves chiefly basal. Heads showy, solitary upon elongate peduncles, their involucres formed of several series of densely woolly herbaceous bracts, the receptacle flat. Ray-flowers yellow, fertile; disc-flowers yellow, each subtended and sheathed by a thin, more or less scarious ~~linear acute~~ bract. d Achenes of the disc prismatic, strongly 4-angled, smooth, those of the rays flattened; pappus none.

d

Cap. 1. B. sagittata (Pursh) Nutt. Balsam-root. ~~Tufted perennial herbs with stout fibrous-coated vertical~~ rootstocks ~~which~~ exude ing an aromatic balsam, the leaves, save one or two much reduced bracts, basal, their blades deltoid, 15-20 cm. long, 10-20 cm. wide, or some of the smaller sublanceolate, cordate-truncate at the base, mostly obtuse at the apex, their margins entire, undulate, both surfaces silvery-tomentose when young, becoming hoary or ashy, borne on petioles 20-40 cm. long; ~~heads usually solitary on elongate slender~~ peduncle ~~peduncles~~ 30-50 cm. long, softly tomentose, bearing two slender oblanceolate bracts lanceolate, 12-15 mm. long; ray corollas ~~yellow~~ 3-3.5 cm. long, elliptical, the disc corollas ~~yellow~~ 6-7 mm. long, each subtended by a linear subscarious bract 10-12 mm. long, acute and woolly at the apex; achenes 7 mm. long.

Common in dry gravelly soil on low hills and prairies in the grassland. According to Lewis the stem was eaten raw by the Indians.

## 24. Wyethia Nutt.

Perennial tufted herbs with stout rootstocks and alternate ample leaves. Heads showy, terminal, their involucres consisting of 3-4 series of unequal herbaceous bracts, the receptacle flat. Ray-flowers pistillate and fertile, yellow; disc-flowers yellow, each subtended by a somewhat herbaceous or chaffy lanceolate bract, subequal and lightly sheathing. Achenes prismatic, 4-angled, the pappus forming a chaffy toothed crown with sometimes 1-2 additional chaffy awns.

1. W. amplexicaulis Nutt. → Coarse glabrous perennials with several stems ascending and spreading from a stout crown, 30-60-100 cm. tall, forming conspicuous tufts; basal leaves elliptical, oblong-lanceolate, or lanceolate, 30-60 cm. long, 8-15 cm. wide, acute or acuminate, narrowed to a short clasping petiole, entire or obscurely denticulate, dark green and sticky from numerous resin glands on both surfaces; stem leaves successively smaller, the upper sessile and clasping the stems, crowded; heads terminal with usually 2-5 smaller lateral ones, their involucral bracts lanceolate, leaf-like, 2-4 cm. long; ray-corollas bright yellow, 30-35 mm. long; disc-corollas yellow, 5-10 mm. long, subtended by submembranous or somewhat chaffy, lanceolate, acute, glabrous bracts 12-15 mm. long; achenes 8-10 mm. long. ~~bearing a lacerate, chaffy crown at the apex sometimes with one or two longer chaffy awns~~

Abundant toward the grassland on low open hills.

## 25. Rudbeckia L.

Perennial herbs with alternate leaves, the lowermost of which are borne on ample petioles, the uppermost being nearly or quite sessile. Heads with or without ray-flowers, rounded or conic, the receptacle convex to conic, even cylindrical in fruit, bearing chaffy bracts. Achenes obovoid or top-shaped, truncate at the apex, more or less 4-angled, the pappus either wanting or a chaffy crown. =1

tr.

0 Stout coarse herbs 80-200 cm. tall, the stems
4 glabrous, the heads without ray-flowers ... 2. R. occidentalis

0 Hispid-hirsute herbs 30-50 cm. tall, the heads
4 bearing conspicuous yellow ray-flowers ... 1. R. hirta

1. R. hirta L. Black-eyed Susan. ~~A perennial~~ herb 30-50 cm. tall with slender usually branching hispid stems, mostly purple dotted at the bases of the hairs; leaves elliptical-lanceolate, the blades 4-10 cm. long, 1.5-4 cm. wide, acute at both ends, ~~attenuate to slender petioles which at the base are as long as the blade,~~ both surfaces hirsute and rather rough, the margins entire or sparingly denticulate; heads usually several, on slender peduncles 15-25 cm. long, subglobose, their involucres consisting of about two series of reflexed linear-lanceolate or oblanceolate hispid bracts 10-15 mm. long; ray-corollas yellow, about 2 cm. long, disc-corollas purple, 3.5-4 mm. long, the bracts of the receptacle linear-oblong, obtuse, sparingly hispidulous, twice as long as the achenes; achenes 1.5 mm. long, without pappus.

Occasional in waste places at low elevations.

2. R. occidentalis Nutt. Nigger-heads. A stout coarse ~~perennial~~ herb 80-200 cm. tall, the stems usually several from a stout crown, leaf-blades 10-15 cm. long or more, broadly ovate, acuminate, rounded at the base and abruptly attenuate to winged petioles ~~which may be as long as the blade in the lower parts,~~ the uppermost leaves ~~being~~ sessile, margins of the lower leaves irregularly and coarsely dentate, the upper entire, all either glabrous or pubescent on the lower surface at least on the veins; heads dark purple, ovate or cylindridal, 2-5 cm. tall, without ray-flowers; involucres loose, of several recurved or spreading leaflike lanceolate bracts 10-40 mm. long; disc-corollas 3.5 mm. long, the bracts of the receptacle densely puberulent, subequal to and sheathing the achene; achenes 3.5-4 mm. long, the pappus chaffy, forming a crown at the apex. =1

Common in subalpine meadows and on moist slopes usually at higher elevations; browsed by sheep.

## 26. Helianthus L. Sunflower.

Erect coarse herbs with single leaves and showy yellow flowers. Involucres hemispherical, consisting of about 3 unequal series of herbaceous bracts; receptacles flat, covered with chaffy bracts. Ray flowers yellow, sterile; disc-flowers dark purple. Achenes obovate, somewhat compressed, 4-angled; pappus of 2 deciduous chaffy scales or awns.

1. H. annuus L. → A weedy annual 1-2 m. tall, the stems rough; leaves alternate except the lowermost, all petioled, variable in size, the blades 5-20 cm. long, ovate, rounded or cordate at the base, dentate or entire, rough on both surfaces, the petioles mostly as long as the blade or longer; heads 5-15 cm. broad, showy, the ray corollas 30-40 mm. long or more, broadly elliptical; scales of the receptacle 8-10 mm. long, 3-cleft, hispidulous towards the apex; achenes 3-6 mm. long.

A frequent weed in waste places at low elevations. Occasional other species may be found in marginal lower lands.

## 27. Gaillardia Foug. Blanket Flower.

Perennial herbs with alternate [illegible] leaves. Heads solitary on long peduncles, showy, hemispherical, [illegible] globose in fruit, their involucres formed of about [illegible] series of [illegible], lance-shaped, becoming reflexed in fruit, the receptacle [illegible], bearing bristle-like [illegible]. Ray-flowers mostly [illegible], yellow, commonly purplish at the base; disc-flowers purple or reddish-brown. Achenes top-shaped, densely hispid, the pappus formed of [illegible] scales which taper into a slender acute membranous awn [illegible].

1. G. aristata Pursh. → An erect ~~perennial~~ [illegible] with branching pubescent stems which are rough to the touch; lower leaves [illegible] or oblanceolate, 6-18 cm. long, tapering to a slender [illegible], subentire or toothed, or pinnately and irregularly lobed, [illegible], more commonly entire, sessile or nearly so, all roughly pubescent; heads several, ascending, on peduncles 15-50 cm. long, their involucral bracts lanceolate, 5-20 mm. long, acute or acuminate, roughly villous; ray-corollas [illegible] mm. long, the blades [illegible], 3-[illegible] toothed, yellow [illegible], mostly reddish-brown, [illegible] long; fruiting heads globose, the bracts reflexed; achenes [illegible] mm. long, the pappus 6-7 mm. long.

Common in gravelly soil in the grassland or in open dry places at low elevations.

## 28. Helianthella T. & G.

Perennial herbs with thick rootstocks and entire leaves, the lower opposite, the upper alternate. Heads showy, terminal, their involucres consisting of 2 series of unequal herbaceous bracts, the receptacle flat or convex. Ray-flowers yellow, sterile; disk-flowers yellow, each subtended by [illegible] bracts. Achenes wedge-shaped, strongly flattened, [illegible] awl-shaped awns.

1. H. Douglasii T. & G. Stems several, erect, sparsely ø =/ hirsute, 60-90 cm. tall; lower leaves opposite, alternate above to an indefinite height, [illegible] sessile, all narrowly elliptical, or the lower oblanceolate, the upper lanceolate, 8-15 cm. long, 1-1.5 cm. broad, entire, sparingly hirsute; bracts of the head are linear-lanceolate, acute, 15-25 mm. long, strongly ciliate; ray-corollas 2.5-3 cm. long; disk corollas 6-7 mm. long, pubescent at the tips, the subtending bracts somewhat shorter, pubescent and truncate at the tips; achenes 10-11 mm. long, wedge-ø =/ shaped, very flat, the awns about 3 mm. long, variable.

Frequent on dry hills near the grassland.

## Tribe Madiae.

Slender annual herbs. Leaves mostly alternate or the lower opposite. Heads small, ovoid, the bracts in a single series, each enclosing a marginal flower and at maturity an achene. Receptacle flat, commonly bearing a series of chaffy bracts between the marginal and disc flowers. Ray flowers present but inconspicuous. Ray achenes fertile, disc achenes fertile or sterile. Pappus none.

## 29. Bidens L. Sticktight.

Annual herbs with opposite, simple or pinnate leaves. Heads either with or without ray-flowers, their involucres consisting of two dissimilar series, the outer herbaceous, oblong or oblanceolate, the inner shorter, broader, chaffy, firm, brownish, passing into the similar oblanceolate or lanceolate deciduous bracts of the disc; receptacles naked at maturity, convex. Ray flowers yellow when present, sterile; disc-flowers yellow. Achenes strongly flattened, cuneiform, bearing a rib on each face and either 2 or 4 rigid spinose retrorsely barbed awns.

| | |
|---|---|
| o Ray flowers usually present; leaves simple | 1. B. cernua |
| o Ray flowers absent; leaves 3-5-pinnate | 2. B. vulgata |

1. B. cernua L. → A weedy herb of great variability in aspect and stature, the stems 30-80 cm. tall, branching in the inflorescence, the branches ascending or arcuate, glaucous, sometimes sparingly pubescent above; leaves simple, 5-12 cm. long, the lowermost oblanceolate, soon deciduous, the upper oblong-oblanceolate or narrowly elliptical, acute or acuminate, sessile, sharply serrate, glabrous; outer bracts of the involucre 12-20 mm. long, oblong-elliptical, mostly narrowed at the base with an obtuse or rounded sinus, the inner 7-9 mm. long, ovate; ray-corollas present, bright yellow, 12-15 mm. long; disc-corollas yellow, 3 mm. long; body of the achenes narrowly cuneiform, 7-8 mm. long, bearing 4 spinose awns 3-3.5 mm. long, retrorsely barbed, as are also the ribs and the margins.

Frequent in stagnant water or boggy ground at low elevations.

2. B. vulgata Greene. → An erect weedy annual 60-90 cm. tall, with virgate stems which branch in the upper part, the branches strict, ascending, sparingly pubescent above, glabrous; leaves pinnately 3-5-foliolate, the leaflets mostly lanceolate, 3-5 cm. long, the middle one largest, all more or less serrate, scabrous beneath, petioles of the lowest leaves as long as the blades, those of the upper much reduced or wanting; heads on unequal peduncles 5-10 cm. long, discoid, outer involucral bracts 10-15 mm. long, scabrous, the inner ovate or elliptical, 5-6 mm. long, scarious margined; disc-corollas 2.5 mm. long, yellow, with brown veins; achenes yellow, becoming sordid brown, the body cuneiform, 6-7 mm. long, hispid on the ribs and margins, bearing 2 spinose awns 2-3 mm. long, retrorsely barbed.

Frequent in boggy ground which later becomes dry.

## 30. Madia Molina.

Slender weedy annuals with linear or linear-lanceolate entire leaves, the lower opposite, the upper alternate. Heads few, on slender peduncles or in small clusters, these and the branches glandular with stalked glands. Ray flowers inconspicuous, pistillate, 2-12, enclosed by the boot-shaped bracts of the involucre; disc-flowers solitary or several, subtended by a series of chaffy bracts. Achenes more or less compressed laterally, curving somewhat, at least those of the disc usually angled, those of the ray flowers completely enclosed by the bracts; pappus none, at least in the ray flowers.

0 Inconspicuous annuals 5-20 cm. tall, the bracts of the
4 involucre 3 mm. tall — 1. M. exigua

0 Erect slender annuals 30-60 cm. tall or more, the
4 bracts of the involucre 6-8 mm. tall

2 Heads 4-5 mm. wide, mostly solitary at the ends of
6 branches, or 2-3 in racemes — 2. M. ~~disciflora~~ gracilis

2 Heads 2-4 mm. wide, in clusters of 2-4 at the ends of
6 branches — 3. M. glomerata

1. **M. exigua** (Sm.) Greene. → Small inconspicuous annuals 5-20 cm. tall, usually branched, the branches widely spreading, slender, hispid in the lower parts, glandular above; leaves few, mostly opposite or the upper alternate, linear, 1-2 cm. long, 1-2 mm. wide, hispid-hirsute; heads 3 mm. in diameter, the bracts 3 mm. long, strongly glandular, 4-8 in number, enclosing almost completely the ray flowers, disc-flower solitary; achenes hardly compressed, 2.5 mm. long, narrowly obovate, curving lightly except that of the disc which is straight.

Common in dry gravelly soil at low elevations.

2. *M.* ~~*dissitiflora* T. & G.~~ gracilis (Smith) Keck. Erect slender annuals 30-60 cm. tall, the stems thinly spreading-hirsute, glandular above; leaves linear or linear-lanceolate, 3-7 cm. long, 3-5 mm. wide, sessile, clothed like the stems; heads few, ovoid, solitary at the ends of leafy branches or some axillary, 8-9 mm. tall, 4-5 mm. wide, ray flowers (and bracts) several, usually more than 5, the bracts 7-8 mm. long, densely glandular, disc flowers few, the subtending series of bracts chaffy or submembranous, more or less plane, 5-6 mm. tall; ray and disc achenes 4 mm. long, similar, the latter more strongly angled, the former more strongly compressed little or not at all angled. (*Sclerocarpus gracilis* Smith; *M. dissitiflora* (Nutt.) T. & G.) =/

Frequent in dry soil along roadways or in gravelly prairies in the grassland.

3. *M. glomerata* Hook. Erect slender annuals 30-60 cm. tall or more, leafy throughout, the stems hispid with ascending hairs; leaves 3-7 cm. long, 2-5 mm. wide, sessile, linear or linear-lanceolate, clothed like the stems; heads borne in clusters of 2 or 4 at the tips of short lateral branches, elliptical, 6-8 mm. long, 2-4 mm. wide, the ray flowers 2-3, usually less than 5, the bracts 5-7 mm. long, densely glandular, the disc flowers few, the subtending series of bracts chaffy, 6-7 mm. tall, concave and partly sheathing the achenes, ray and disc-achenes similar, the former somewhat more flattened, all more or less obscurely angled, 4.5 mm. long.

Frequent in dry gravelly soil at lower elevations.

## 31. Lagophylla Nutt.

Erect annuals with very slender, much-branched stems and small alternate entire leaves. Heads numerous, small, few-flowered, in clusters subtended by leafy bracts; involucre consisting of about 5 leaflike bracts which enfold the fertile ray flowers and eventually the achenes, being deciduous with these; disc flowers sterile, subequal in number to the ray flowers, the group being surrounded by an equal number of erect bracts similar to the outer bracts but not enclosing the flowers. Achenes narrowly obovoid, smooth, somewhat compressed; pappus none.

1. *L. ramosissima* Nutt. → Graceful ~~much-branched annual~~ herbs with very slender shining stems; leaves 4-12 mm. long, linear and sessile or the lower spatulate, all silky-hirsute, ashy; heads ~~numerous~~ subtended by several leaves, the bracts of the ray-flowers about 5, 5 mm. long at maturity, hirsute, elliptical, acute, the lower portion enclosing the flower and eventually the achene, the inner bracts similar, somewhat smaller; ray-corollas yellow, deciduous en masse; disc-corollas about equal in number, slender, persistent; achenes 3 mm. long, shining black.

Occasional in dry soil at low elevations. →

no H → Lake Coeur d'Alene, Epling and Houck 10041; Post Falls, Heller 654; Spokane R., Sandberg 654.

## Tribe Ambrosieae.

Erect weedy plants with alternate leaves. Heads of two kinds, those containing the staminate flowers small and greenish, arranged in terminal racemes or panicles, the involucres cup-shaped, those containing the pistillate flowers diverse, either burr-like with hooked spines or like a small nutlet with a series of small teeth near the apex, the involucres in either case being completely closed, the corollas rudimentary or none. Anthers distinct or nearly so. Pappus none.

## 32. Ambrosia (Tourn.)L. Ragweed.

Annual or perennial branching leafy herbs with mostly alternate pinnatifid leaves. Heads small, greenish, monoecious, the staminate pendulous, borne in slender racemes at the tips of the branches, subtended by ~~a~~ broadly funnel-shaped involucres subequal to the whitish flowers, the pistillate heads 1-flowered, borne either in short clusters below the staminate racemes or solitary in the upper axils, the involucres ~~completely investing the flower,~~ obovoid, narrowed to a beak. ~~either naked on the outer surface or bearing a series of small spinescent teeth at the shoulder.~~ Achenes obovoid. ~~pappus wanting.~~ =/

o **Pistillate involucres naked** 1. **A. psilostachya**

o **Pistillate involucres bearing a series of 5-6**

**4 minute spinescent teeth above the middle** 2. **A. elatior**

J 1. A. psilostachya DC. Perennial herbs 40-80 cm. tall or more, with horizontal rootstocks, the stems thinly clothed with appressed stiffish hairs; leaves once or twice pinnatifid, the ultimate segments 2-4 cm. broad, both surfaces ashy-hispid; staminate heads crowded in slender racemes 5-10 cm. long which are arranged in panicles, their involucres ~~funnel-shaped,~~ 2.5-3 mm. long, hispidulous; pistillate heads solitary in the upper axils, obovoid and beaked, hispidulous but devoid of small teeth on the shoulder, the achenes 2-2.5 mm. long.

Occasional as a weed in waste places at low elevations.

Cap. 2. A. elatior L. ~~A~~ weedy annuals 30-80 cm. tall, the stems thinly clothed with appressed stiffish hairs; leaves varied, the lowermost opposite and petioled, the upper subsessile, alternate, once or twice pinnatifid, the divisions 2-3 mm. wide, acute, grayish-hispid; ~~[illegible]~~ staminate heads 15-20-flowered, the involucres ~~funnel-shaped,~~ 2.5-3 mm. tall, hispidulous; pistillate heads obovoid, beaked, bearing 5-6 minute spinose teeth near the shoulder, the achenes smooth, obovoid, 2.5 mm. long at maturity.

Occasional as a weed in waste places.

## 33. Xanthium (Tourn.)L. Cocklebur.

Annual herbs with alternate leaves. Staminate flowers in crowded globose clusters arranged in terminal racemes, their involucral bracts in 1-2 series, the receptacle chaffy. Pistillate flowers subsessile, crowded in the upper axils, the involucres completely closed at maturity forming bur~~r~~s, tipped by 2-3 rigid beaks, densely armed with stiff spines; achenes 2. ~~without pappus.~~

1. X. ~~orientale L.~~ oviforme Wallr. weedy annuals 30-80 cm. tall, with rough stems; leaves 5-8 cm. long, broadly ovate or deltoid-obate, subcordate, obtuse, the margin irregularly crenate-serrate, or shallowly lobed, both surfaces rough with stout short hairs, borne on petioles 3-8 cm. long; staminate flowers borne in globose sessile clusters crowded in ~~short~~ terminal racemes 2-3 cm. long; involucral bracts 2-3 mm. long, lanceolate, hispid, unequal, in a single series; bur~~r~~s oval, 2-3 cm. long, subsessile in the upper axils, the spines numerous, 4-4.5 mm. long, slender, lightly hooked at the apex, glandular and hispid below the middle.

An occasional weed in waste places; said to be poisonous to stock in the seedling stage but too infrequent in our region to be a serious factor. Sandpoint, Epling 10399.